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An examination of the antecedents to small and medium enterprise co-operation, and their effect on network propensity and behaviour.

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AN EXAMINATION OF THE ANTECEDENTS TO SMALL AND MEDIUM ENTERPRISE CO-OPERATION, AND THEIR EFFECT ON NETWORK PROPENSITY AND BEHAVIOUR

by

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ABSTRACT

Business co-operation in the small firm sector has in recent years been the beneficiary of both considerable academic debate and public sector funding for its facilitation. This thesis reviews the pertinent literature in the fields of business co-operation, trust, commitment and personality psychology. The limitations of existing networking - co-operation SME research are identified, and in particular the dearth of empirical based research. Where such research exists, no attempt is made to isolate variables which might determine whether individuals are likely to co-operate with others, and / or the likely success of their co-operative activities. As a means of addressing these perceived flaws in the literature the potential antecedent role of owner-manager's personality, business related group affiliation, and owner-manager's and firm's demographics are examined in relation to their propensity to co-operate with others. A polymorphous definition of SME sector co-operation is adopted in which it is possible for actors to co-operate with varying parties and in a number of capacities. Extensive use is made of univariate chi-square and multivariate logistic regression techniques, with a logistic regression model ultimately being extended for each of the types of co-operation identified. The second phase of the empirical research conducted is focused upon the individual business network. Potential antecedents to small firm network success are examined at the aggregate level, and recommendations offered which network actors and facilitators can utilise as a means of heightening the likelihood of success within their own groups. The thesis closes with a re-examination of the hypothesis, drawing of conclusions relating to them, and the identification of areas for further research.

AUTHOR'S DECLARATION

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award.

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A number of business related conferences were attended, with authored or co-authored papers being presented to plenary or streamed sessions at nine national or international conferences. Three papers have been published to date, three more are forthcoming. The most relevant of which being:

Conferences:

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ABBREVIATIONS

BEMA	Bristol Engineering Manufacturers Association
CCP	Competitor Co-operative Propensity
CEO	Chief Executive Officer
CSS	Collective Stable State
DBSPI	Durham Business School Personality Instrument
EP	External Price
HTSF	High Technology Small Firm
IC	Internal Cost
IMP	Industrial Marketing and Purchasing Group
LR	Logistic Regression
MDCC	Multidimensional Commitment Construct
MNC	Multinational Company
NCO	Non-co-operators
OC	Organisational Commitment
OCQ	Organisational Commitment Questionnaire
OMs	Owner Managers
OMD	Owner Manager Director
P	Punishment
PDG	Prisoner's Dilemma Game
PPS	Plymouth based hotel and guesthouse group
PTC	Purchasers Transaction Costs
R	Reward
SMEs	Small and Medium Sized Enterprises
T	Temptation
TC	Transaction Costs
UK200	UK200 Accountancy Group

Chapter One - Introduction

In the past there has been a certain amount of confusion associated with the definition of small and medium enterprises (SMEs); to avoid any confusion or misinterpretation the European Observatory for SMEs (1993) definition has been adopted for the purpose of this study. Consequently firms employing up to nine employees are referred to as micro-businesses, organisations with ten to ninety nine employees - small firms, and companies retaining between one hundred and four hundred and ninety nine staff are termed medium sized. SMEs account for 99.9% of *all* firms operating in Europe (95% in the UK), with micro-businesses accounting for by far the largest proportion of firms (93.13%), and small and medium firms representing 6.42% and 0.45% respectively. The significance of SME research is thus self evident. It is only through greater understanding of the problems faced by these organisations and implementation of potential solutions, that employment opportunities and wealth generation within these organisations can be optimised and enhanced.

Keeble (1990), in his analysis of new business value added tax (VAT) registrations, claims to show an increase of approximately 50% between 1980 and 1988. Although VAT measurement represents an imperfect analytical tool (the turnover of many firms is too low to require registration, black market operators are not included, etc.) it does however point towards an increase in firm numbers over the nine year period, or to micro-business growth, where incomes have increased to a point at which VAT becomes payable.

Net changes have, however, succeeded in masking the increased amount of churning within the sector. Firms are particularly vulnerable in the first three years of trading, and although mortality levels vary across studies - Cromie and Ayling (1988) - 33%, Mason (1985), 29%, Storey and Johnson (1987), 40% - the high failure rate during this period is beyond

question. The increased importance of those firms that do grow has been shown by recent OECD figures (1994) which point to SMEs as the *only* source of employment growth for the early 1990s (Cooke, 1994: 2). Their growing employment role is in marked contrast to multinational employment policy, which has favoured "corporate downsizing". This has resulted in a shift in government emphasis away from multinational support systems, and towards practices which are more beneficial to the SME producer / service provider.

Owner-managers' motives for starting their businesses are surprisingly heterogeneous, with only a small number of firms actually desiring growth. The vast majority of firms remain small. Gray (1993) points to organisational traits of low growth orientation and stubborn individualism which he argues are representative of the small business population as a whole.

Where owners are growth oriented, expectations are most likely to be unfulfilled due to poor business strategies and in particular market research and sales plans. Pavia's (1990) survey of sixty-eight high technology small firms (HTSFs) in Georgia, USA identified a clear relationship between meeting customer needs and business success, but found that at least half the enterprise owners interviewed had either not grasped or had not incorporated this fact into their business strategy. A similar sub-optimal position has been found in the UK where an analysis of twenty small high-technology firms found that most lacked a formal marketing function, and as a result had failed to integrate the marketing philosophy into their operational divisions (Johne and Rowntree, 1991).

In other instances where actors are conscious of the need for these functions, the necessary skills and resources may be inadequate or absent altogether. Core competency deficiencies (Coombes, 1994) will become increasingly evident, as one progresses down

the size continuum, with lack of resources and skill needs being particularly marked in the micro-business. One particular area which has been identified as a potential solution to these difficulties, and as a mechanism for enhancing SME performance is the role of networking and linkage building between firms.

The networking literature though, is characterised by ambiguity in terms of definition, application, methodological approach and implementation. This dilemma is exacerbated by the continued use and development of the word often for entirely different reasons in fields as diverse as criminology (Barlow, 1993), computing (Dyson, 1994; Sheldon, 1994; Nemzow, 1993), ecology (Lipnack & Stamps, 1984), political science (Barnes, 1969; Ruan, 1993), psychiatry (Rueveni, 1979), social care (Payne, 1993; Trevillon, 1992), sales and marketing (Carmichael, 1991), town and country planning (Chapman, 1994) and the old boy network (Head, 1983), to name but a few.

Despite being around as a concept for over thirty years, networking is a relatively new business discipline, and as such presents a number of significant difficulties for researchers wishing to investigate it. The multi-disciplinary nature of the subject forces individuals working in this area to acquire competencies in, and knowledge from a number of different fields, principally: anthropology, corporate strategy, economics, geography, marketing, psychology, and sociology. Consequently, the literature is represented by academics from each of these fields, as well as others in which networking usage is more marginal. As a result, a number of unique problems are faced by those researching co-operative strategy and networking.

The first of these is the sheer quantity of material; the disciplinary breadth covered makes it extremely difficult for an individual researcher to make a definitive and complete review of

the literature. This problem will continue to prevail until such a time as a seminal book or paper is published, which succeeds in achieving awareness and acceptance across disciplinary boundaries. The co-operative idyll has also proved to be an appealing and seductive notion. Its attractiveness has had the effect of creating an excessive demand for research in this area, at the expense of quality. Networking literature should not be dismissed *en masse*, rather usage should be tempered in the knowledge that this is the case, and readers should be mindful of the existence of chaff when harvesting for wheat. Low quality thresholds have created a tolerance for poor research demonstrated in the lack of empirical evidence. Where empirical information is available it is generally based on poor methodology - small samples, absence of control groups and so forth. Existing work is dominated by anecdotal evidence, longitudinal studies have not as yet been conducted, and results obtained are therefore often a snapshot view of the network or firm, or are dependent on the memory or honesty of the respondent.

All of the above difficulties are compounded by the consistent reluctance of writers to define what networking actually is; Jarillo & Ricart (1987) proving to be a notable exception to this rule. Networking and co-operative strategy is thus unlikely to gain greater acceptance as a third organisational structure (the existing two being markets and hierarchies) (Williamson, 1975), until such a time as theorists within the field can agree on or even develop a workable definition and characteristics on which they can themselves agree.

Given the myriad number of interpretations of the words 'networks' and 'networking' both within everyday usage, and within the literature review presented hereafter, there is a clear need to clarify their meaning in relation to the research presented within this document.

A network is therefore defined here in the spirit of Jarillo and Ricart (1987) as being any co-operative relationship involving two or more parties, who invest time, resources or capital in return for future mutual and approximately equivalent advantage(s). True to logic 'networking' is therefore defined as the act of pursuing, establishing or maintaining such relationships.

In the interest of clarity however, and to avoid respondent misinterpretation during the data collection phase of this research 'co-operation' or 'co-operative activities' are frequently used as proxies for 'network' or 'networking' based activities. It is only when reviewing the literature, and when authors reviewed have made use of the words 'network' or 'networking', that these terms are presented within the text, at all other times 'co-operation' or 'co-operative activities' are used, and should therefore be viewed to all intents and purposes as 'network' or 'networking' synonyms. Possible encoding - decoding difficulties inherent in offering a definition of networking / co-operation to individuals sampled through the first phase questionnaire were avoided by asking respondents to indicate which activities and parties they had been involved with in the past, e.g. new product development with competitors (as defined in question A3). This question was used as a filter question, with respondents who indicated they had been involved in any of the listed activities (an "other please specify" option was also included) with any of the listed parties being classified asco-operators, whilst those who had not been involved in such activities were defined as non-co-operators.

This document thus aims to go some way to reducing the effects of these difficulties, though it makes no claim to being definitive, and notable limitations should be identified at this stage. Although literature exists which addresses large company to large company linkages such as joint ventures between two or more multinational companies (MNCs)

(Boyd, 1990; Herzfelt, 1983; Kay, 1992; Krackhardt & Hanson, 1993; Lei, 1993; Murray & Mahon, 1993; Silver, 1993) these are omitted from the review in favour of small and medium enterprise (SME) relationships. SMEs and multinational companies (MNCs) are not comparable, either in terms of firm demographics, business practice, access to finance and or management structure (Storey, 1994). Similar reasoning can be used to explain the omission of vertical transaction-based linkages such as those between MNCs and SMEs (Green *et al*, 1990; Lorenzoni & Ornati, 1988; Oakey, 1993; Pache, 1990; Smith, 1982), as found in a supply chain (Porter, 1986). Emphasis is instead placed on SME to SME linkages, where power relationships are assumed to be more equitable. While it is recognised that small firms make up a substantial proportion of total business activity, the amount of networking research focused specifically on this group has been comparatively small, and there is thus a need for further research within this specific area, particularly at the empirical level.

Given the above, this review will take the following format. Chapter two will examine the literature relating to networking – co-operation. Consideration is given to the literature relating to network terminology, and in particular previous attempts at defining the paradigm. This then leads into a consideration of the literature base which views the network as a third organisational mode, which represents an alternative to the adhoc exchanges of the market, or the risk internalisation to be found in the hierarchy. Additional benefits to be gained from co-operation are then discussed along with the potential costs and difficulties, which can be encountered through interacting in this way. Parallels are drawn between the work of the IMP group and what is hereafter referred to as the general / mainstream networking literature. Particular emphasis is placed on the need for trust and commitment within any co-operative agreement, with these variables being considered within a prisoner's dilemma game theory framework. A review of the empirical data on

networking is then conducted, with a view to identifying its limitations, and areas in which future research might improve upon it.

The third chapter considers literature relating to both the mainstream and entrepreneurial personality psychology fields, and the potential antecedent role that owner-manager personality and attitudes play in shaping individuals co-operative propensity and behaviour. This then develops into a discussion of the ways in which public sector involvement in SME networking may be beneficial (Chapter Four), and areas in which future research might be pursued.

Research philosophy, methodology and hypotheses employed are outlined in Chapter Five. Particular attention is given to the research philosophy adopted, and the potential source of bias that it represents. Hypotheses are then identified which suggest network propensity, activity and success will be influenced by the personalities, motivation and business group affiliation of owner-managers. In addition to hypotheses which identify trust and commitment as potential key mediating variables in the process (Morgan & Hunt, 1994).

Results and discussion for the two phases of the research are offered separately, with findings from phase one being presented and considered in Chapters Six and Seven and those relating to phase two in Chapter Eight.

A brief summary of the research, recommendations for future research and conclusions are then extended in the final chapter, Chapter Nine.

Chapter Two – Network Literature

2 1 Definitions of Networks

Definitions of 'networks' and 'networking' are rare, and where they are volunteered they are frequently of only limited use (Grandori and Soda, 1995; Salancik, 1995). Shaw in her advocacy of networks as a strategic entrepreneurial marketing tool is even more strident in her criticism, suggesting that *"few researchers have considered what is implied by the terms 'network' and 'networking' or sought to provide an explicit definition of what they interpret these terms to mean."* (Shaw, 1998a: 2). It is therefore not surprising that the terms 'networks' and 'networking' have been the subject of on-going academic use and abuse. Ebers (1997: 15) suggests that *"This is possible because the notion of 'network' is sufficiently abstract."* He continues by arguing that this is the case because *"it can be employed to characterise any set of recurring ties (e.g. resource, friendship, informational ties) among a set of nodes (e.g. individuals, groups, organizations, information systems and so on) (Fombrun 1982)."* (*Op. Cit.*, 1997: 15). Casson and Cox (1997: 175) offer support for Eber's point arguing that *"Networks mean different things to different people"*. This does not however prevent them from offering what they refer to as a *'simple definition of a network'*, for Casson and Cox (1997: 175) a network is *"a set of linkages which either directly or indirectly connect every member of a group to every other member of the group."*

Such diverse use of the term 'network' both inside and outside of the business discipline can clearly prove problematic, its divergent usage proves a significant barrier to those seeking to review a specific part of the literature in the field, as it is rarely clear from the title of 'network' papers whether they relate to friendship, informational ties, etc. Ebers (1997: 16) suggests that unless more precise use of the term is made in the business field,

the outlook for researchers active in this field will be a bleak one: *"because the notion of the network is so general, its application to organizational analysis runs the risk of extending the notion indiscriminately until it ceases to have any analytical and theoretical power it might possess for organizational research."*

Whilst the problem of defining 'networks' and 'networking' is readily identifiable, the solution has proved somewhat problematic. Whilst Axelsson and Easton's (1992: xiv) demonstrate that there is opinion congruency with regards to the structure of 'networks': *"A network is a model or metaphor which describes a number, usually a large number of entities, which are connected."* As is illustrated in Hakansson and Johanson (1993) most network research and thus definitions of networks relate to social networks (Burt, 1982; Cook & Emerson, 1984; Iacobucci and Hopkins, 1992; Willer and Andersson, 1981).

Other definitions of a network that are offered frequently follow Cook and Emerson (1978) who *"define a network as a set of two or more connected exchange relations."* Where *"Exchange relations are defined as connected if exchange in one relation is contingent upon exchange or non-exchange in the other relationship (i.e. the magnitude and frequency of transaction in one relations is affected by the magnitude and frequency in another relation) (Cook, 1981)"* (Hertz, 1992: 106). Such a definition stresses the importance of actors and their resources beyond the dyadic level. From the above therefore, it is evident that research approaches which focus upon dyadic relationships, thereby ignoring actors 'extended networks' will present the researcher with an imperfect picture of the resources available to its subjects. This point is echoed by Adams (1980) who also stresses the context in which actors interact, he *"perceived each network as being embedded in a network of organizations which influence it, some directly and some indirectly."* (Tichy, 1989: 236). It is these indirect as well as the direct linkages that represent the *"evaluative*

criteria" - which firms use to assess one another (Holm, Eriksson and Johanson, 1996: 1036; Anderson et al. 1994; Kelly and Thibaut 1978).

2 2 Distinguishing between Industrial and Social Networks

Definitions of industrial networks, the networks with which this thesis is principally concerned are less frequently volunteered, and where they are, generally adopt social network definitions as a starting point. Following on from their general definition of a network (as outlined above) Axelsson and Easton's (1992: xiv) seek to disaggregate industrial networks from networks as a whole. Industrial networks they argue are economically driven and long term in nature: *"In the case of industrial as opposed to say, social, communication or electrical networks, the entities are actors involved in the economic processes which convert resources to finished goods and services for consumption by end users whether they be individuals or organizations. Thus the links between actors are usually defined in terms of economic exchanges which are themselves conducted within the framework of an enduring relationship."*

Axelsson in his own paper of the same year (1992: 240) takes this definition still further, defining an industrial network as one which is comprised not only *"of the actors and the relationships between them, but also of certain activities/resources and the dependence between them."* These three component parts he argues are inextricably linked, a view which is shared by Hakansson and Johanson (1993) who in their analysis of supply chain networks take the argument further, by introducing the concept of power and control. They suggest that *"Each actor controls certain activities and resources directly, but because the*

dependencies to some extent mean control, the actor has an indirect control over the counterparts' activities and resources." (Op. Cit, 1993: 36).

Another crucial difference between social networks and industrial networks according to Hakansson and Johanson (1993: 35) is that *"Social networks are dominated by actors and their social exchange relations. Activities in which they are engaged and the resources they use are basically seen as secondary attributes of the actors."* On this basis they argue they differ significantly from industrial networks where *"Evidently, the reason for placing attention not only on actors but also on activities and resources is the strong interdependencies between all those three elements"*.

Although as is stressed by Shaw (1998b: 9) the *"research that has been carried out on small firm networks (...) has tended to concentrate on exploring the influence that morphological characteristics of networks have on small firm behaviour"* and *"Less work has focused on the influence of interactional characteristics"* it is worth because of their frequent use within the literature introducing the terms here.

2 3 Classifying Networks

The most common labels used by researchers to describe networks are extensiveness; exclusiveness; density; activity levels; centrality and reachability; types of tie; strength of the tie; formality level; structuredness; homogeneity; hierarchy and bridge. These will now be discussed in turn.

Extensiveness - This is simply a description of the number of individuals or units of which the network is comprised (Blackburn, Curran and Jarvis, 1991).

Density – This is a measure of the number of existing links between members relative to the total if all network members were connected (Barnes, 1969; Blackburn, *et al*, 1991; Cromie, Birley and Callaghan, 1993; Granovetter, 1973).

Existing networking practices can be categorised by using a pair of dichotomies: between formal and informal and high and low intensity relationships (See Figure 2.1). While these dichotomies allow ease of classification, in reality there will be a range (which could more accurately be shown using a continuum) of possible intensities and in/formal relationships. The matrix in Figure 2.1 gives examples of different network / co-operative relationships classified according to formal/informal, high/low intensity structure. The matrix offered here is designed to illustrate examples, but it should be noted that each business may have a range of relationships which would fit into different cells and change over time. Intensity here is defined as a function of the level of interaction and influence between actors.

Business club social events and high intensity research and development relationships, while both forms of co-operation cannot be lumped together and considered as though they were uniform. There is thus a need to separate out the forms of networking (as shown in Figure 2.1) and consider their relative costs and benefits to the participating parties in turn.

Figure 2.1 - Network Intensity - Formality Matrix

	Formal	Informal
High Intensity	* Strategic Alliance * Contracted transactional relationship	* Adhoc research * Information Sharing * Shared R&D
Low Intensity	* Sleeping Partner	* Trade Associations * Business clubs

The above classification provides evidence of the extensive use of existing co-operative interaction between firms. Networking is thus not so much a new approach, as an alternative means of conceptualising business practices, and one which recognises the potential benefits of co-operation over more traditional competitive practices.

Hakansson and Johanson (1988) view formal co-operation as being implemented where visibility is the primary motive. Conversely informal co-operation prioritises business gains. Formal co-operation, it is argued, rarely leads to real co-operation, which is found in informal co-operation which is less frequently visible (Hakansson and Johanson, 1988).

Having defined the various types of networks and their relative characteristics, the rest of this document will be related to those ties which could be defined as being: purely

instrumental relations, and in particular linkages between SME owner-managers. Transaction relationships can also be found in the business sphere, but for the most part these relate to subcontracting relationships between large corporations and their smaller suppliers. These have already been considered extensively by other researchers (Bridgewater, 1992; Lorenzoni and Ornati, 1988; Oakey, 1993; Pache, 1990) and will therefore be omitted for the most part from this review.

This section has sought to provide the reader with the necessary definitions and terminology necessary for understanding later sections of this document. Having identified what networking is, it will now address the issue of why a firm should network. This will be achieved by examining what motivations lie behind individual's decisions to participate or not, in networks at the voluntary level. A critical evaluation of the relative benefits and costs of participation will be offered in sections 2.2, 2.3 and 2.4. In recognition of the fact that decisions to co-operate may not be pragmatically made in all instances, the literature on entrepreneurial personality is reviewed to determine whether there are characteristics which make an individual inherently un/co-operative.

The next section considers the merits of reduced transaction costs, one of the most frequently cited benefits of SME networking - co-operative practice.

2.4 Between Markets and Hierarchies

A number of studies in recent years have drawn attention to the changes in organisational structure and theory (Williamson, 1975; Mueller, 1986; Jarillo & Ricart, 1987). The most influential of these is that of Williamson's 'Markets and Hierarchies'. He suggests that historically two systems have existed: the market in which actors interact and incur transaction costs through adhoc exchanges, and hierarchies, which are evident where there is a need to internalise the risk and costs as a means of facilitating efficiency gains. The business network seeks to plug the gap between the pure competition of the market and the significant interdependence and lack of flexibility inherent in the hierarchy.

Powell (1991:271-2) argues that the network represents a superior organisational form:

"in network modes of resource allocation, transactions occur neither through discrete exchanges nor by administrative fiat, but through networks of individuals or institutions engaged in reciprocal, preferential, mutually-supportive actions. Networks can be complex: they involve neither the explicit criteria of the market, nor the well organised routines of the hierarchy. A basic assumption of network relationships is that parties are mutually dependent upon resources controlled by another, and that there are gains to be had by the pooling of resources."

Networks are trust-based relationships, and are therefore most frequently characterised by informal linkages. Formal relationships may also be beneficial, although Johannisson (1987b) suggests that motives for such co-ordination are best attributed to need for visibility rather than a genuine desire for co-operation between the actors.

Jarillo and Ricart (1987) classify these organisational structures in a matrix along with Ouchi's (1980) 'clans'. Ouchi suggests that the hierarchy as defined by Williamson often fails to achieve its principle goal, that of transaction cost reduction. He puts forward an

alternative which he believes to be more utilitarian. Clans, like networks, are long term relationships. Through the achievement of a common culture and the benefits of the formal environment they are able to reduce supervisory costs as these are internalised within the system or organisation (Jarillo and Ricart, 1987).

Figure 2.2 - Two variables (kind of relationship and legal form) intersect to form the main four prototypes of mode of organising economic activity

Legal Form	Zero-Sum Game	Non zero-sum Game
Market	Classic Market	Strategic Network
Hierarchy	Bureaucracy	Clan

Source: Jarillo & Ricart, 1987: 83

The network is not being suggested here as the sole form of organisation, nor is it being proffered as a panacea for world economic growth. It is however an organisational structure which enables some industries and some organisations to make significant efficiency and productivity gains. In particular, it lends itself to the small and medium enterprise (SME) sector where the potential reductions in transaction costs and greater control of the external environment can reduce barriers to entry for individual firms. The

potential benefits of networking to the SME owner-manager will be discussed in more depth in later sections.

Jarillo and Ricart (1987:85) cite Williamson (1975) suggesting that the inefficiencies of markets (transaction costs) are the result of four factors:

"man's bounded rationality (Simon 1976), uncertainty about the future, the presence of a small number of players for a given transaction, and the possibility and opportunistic behaviour on the part of (at least) some of the players."

A successful network, it has been argued, can reduce, if not eradicate these costs (Jarillo & Ricart, 1987; Williamson, 1975; Powell, 1991), especially if the concept of trust is fostered by the actors within the network. Trust in fellow network members removes the fear of opportunistic behaviour which acts to compound transaction costs from all other sources (Jarillo & Ricart, 1987).

Arguments which centre around the reduced transaction cost benefits of networking have not been without their critics. Most notable amongst these is Blois (1990), who challenges their use by Jarillo (1988) on the basis of his assumption of efficiency as the primary goal of management. He argues that the more traditional economic view of profit maximisation would be more appropriate, and proceeds to level further criticism, suggesting that definitional difficulties inherent in transaction cost (T.C.) analysis point to the general dangers inherent in the cross-disciplinary field of networking and business co-operation. T.C.s are, he suggests, both difficult to define, and in practice shared by both parties to an agreement, not as Jarillo (1988) argues, attributed in their entirety to the purchaser. Jarillo states that where the external price (EP) and transaction costs (TC) are greater than the internal cost (IC) the product or service will be internalised (EP+TC > IC). Conversely

where EC+TC < IC the activity will not be internalised enabling the firm to make more efficient use of their resources vis a vis its competitors. In practice T.C.s are frequently shared between the parties to the agreement, with clear rules and conventions as to which are borne by which party (Blois, 1990).

Blois's critique rests on the assumption that all of the T.C.s need to be borne by the buyer for its use as a tool of analysis to be valid. If Jarillo's formula is amended to reflect only those T.C.s incurred by the purchaser (PTC), use will still be valid providing EP+PTC is less than IC.

Neither, Jarillo (1988; 1989) or Blois (1990) consider the other parts of the equation. Transaction cost importance is diminished where the external price is not constant or resources are not available for internalisation of the activity (or where opportunity costs make the 'real' cost prohibitive). A holistic view of networking thus needs to be taken which considers all aspects of co-operative ventures, and their relative advantages and disadvantages when compared against their non-networking rivals.

To conclude in the words of Blois:

"Many economists feel that, in spite of Williamson's extensive work in this field, the concept of transaction costs is still substantially open to this criticism. Perhaps this is a warning to those who wish to use them in their analysis" (1990: 496)

Transaction costs should thus be used with caution, and considered only as one of a number of potential benefits for those who enter into or are contemplating future co-operative ventures. For the time being networking should not be dismissed *per se*, simply because transaction costs usage represents a source of controversy.

2.5 Non-transaction cost benefits of Networking

2.51 Heterogeneity a Networking Necessity

When evaluating the feasibility of a network, consideration of the relationship between skills and network members is essential. If actors within the network are to gain a competitive advantage vis-à-vis their competitors outside the network (Jarillo, 1986 as cited in Jarillo & Ricart, 1987:83) heterogeneous skills are a necessity.

There is no definitive list of abilities required for successful entrepreneurship, but a number of core skills (or core competencies as defined by Coombes, 1994) which are essential to long term survival and growth can be outlined. The emphasis is on possession of heterogeneous skills rather than specialism in a single competency:

> *"The diversity of the qualities required suggests that the entrepreneur needs to be a generalist rather than a specialist. In other words, it is important for the entrepreneur to be reasonably proficient in all aspects of decision making, rather than very proficient in some aspects but inadequate in others" (Casson 1982:34)*

Drawing on previous theoretical and empirical research (Casson, 1982 and Townroe and Mallalieu, 1991) nine key skills can be identified.

(i) *Information accumulation* It is essential that the entrepreneur carefully monitors the environment in which they are operating. They need to be aware of changing fashions and demands of their consumers; the reliability of their suppliers; creditworthiness of their debtors; their competitors' products, prices and outlets; economic conditions; level of government intervention / regulation; social trends and changes in technology. The importance of information evaluation, collection analysis and dissemination should not be

underestimated. Reliable sources of information, and good judgement with regard to the value and implications of that information, will yield a significant competitive advantage to the user.

(ii)*Personnel Management* As the organisation grows, the entrepreneur will have to delegate more and more, leading to a requirement for formal personnel systems.

(iii)*Negotiating* An ability to conduct transactions effectively, and with conviction.

(iv)*Organisation and inventory management* The capacity to allocate time and resources effectively, with particular reference to the management of inputs and outputs.

(v)*Innovation* The SME controller requires, amongst other things, the skills of imagination, application and creativity in order to produce for the market new products and new processes, and/or to find new markets, new sources, new forms of organisational structure (Townroe and Mallalieu, 1991:179).

(vi)*Risk management*: A propensity to take risks and effectively evaluate the nature, and intensity of those risks.

(vii)*Quality control:* A business strategy founded on quality is essential to the long term survival and prosperity of the entrepreneurial firm. Adequate quality control measures and practices should be established, so as to maintain optimal quality levels.

(viii) *Market orientation* It is not enough to simply market the company's products in terms of advertising or via a sales orientation. Emphasise should be placed on market

orientation, so that the needs and wants of the market are foremost in the minds of all employees and at every stage of company development.

(ix) *Financial management* At the heart of this is the need for effective monitoring and control of the net cashflow position.

This classification differs from Casson's in that he fails to consider financial management and market orientation which are deemed to be essential key areas outlined above. Townroe and Mallilieu in their typology outline two separate key skills of arbitrage and risk taking. Here they are amalgamated into the single classification of risk management, in that similarities far outweigh the differences between the two. In addition, information accumulation and personnel management are added to the typology outlined above

As a development of the above classification, entrepreneurs can be broken into two distinct groups - the *individualists* (who either possess or believe they possess the necessary skills for market interaction) and the *sub-optimal realists* (those who perceive they lack one or more of the skills identified above). In Figure 2.3 the shaded area denotes the perceived skills of the owner-manager. The non-shaded area represents those skills in which there is a perceived need for improvement.

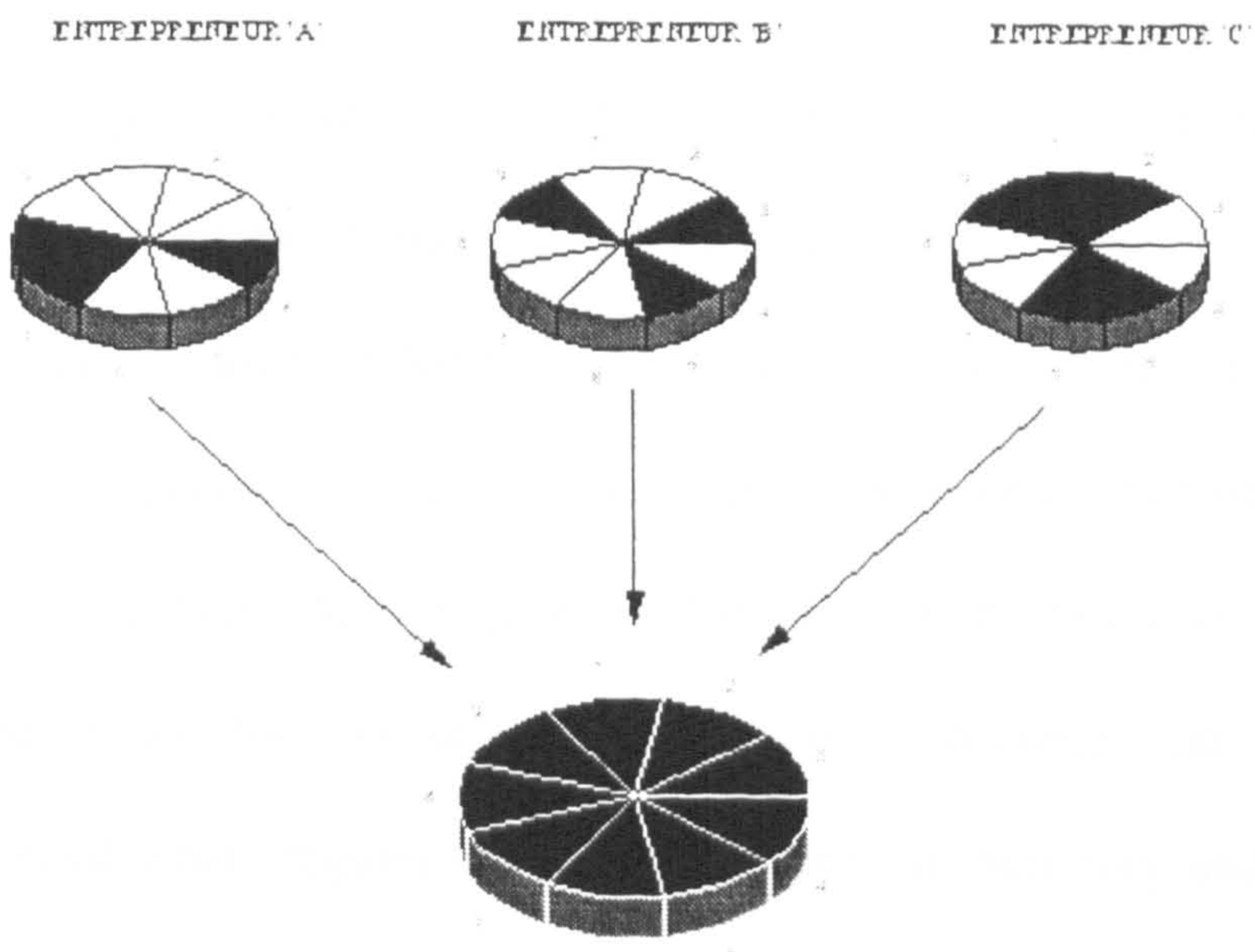
Here the dichotomy is between absolute possession and non-possession of skills. In reality most individuals will at least have some intuitive feel for each skill area because, the fact remains that absolute maximum levels are unobtainable. However, binary classification can provide an adequate guide in terms of satisfactory and unsatisfactory levels of the skills under consideration.

The rationale for professional networking postulated here is that through co-operation of heterogeneous entrepreneurs, small businesses will be able to overcome their individual weaknesses. Through networking, SMEs can overcome these individual weaknesses by co-operating with those that possess the skills they need for producing goods and services for the market place. For example, as demonstrated in Figure 2.4, Entrepreneur A may possess skills 5,6,9; Entrepreneur B - skills 1,4,8; Entrepreneur C - skills 2,3,4,7,8. Thus by co-ordinating and co-operating through the medium of a network it is possible for the collective to acquire every skill necessary for successful entrepreneurship. Where individually the growth of small businesses may be severely limited, through active co-operation limitations can be overcome thereby aiding long term development. It should be noted that the rationale provided here applies only to sub-optimal realists (those who perceive and are aware of their weaknesses) rather than individualists (who do not, or do not recognise they possess such weaknesses).

Through successful co-operation, abilities are gained so that each co-operating SME accumulates skills. As individual SMEs gain skills from each other the national skill base as well as the individual entrepreneur's is augmented in the long run.

Figure 2.3 - The Individualist & Sub-optimal Realist

Figure 2.4 - Networking as a means of Skill Acquisition



This typology was originally presented in White *et al* (1996a) as a tool for analysing entrepreneurial skill possession and deficiency in Eastern Europe, where the vast majority of entrepreneurs, it was argued, will fit into the *sub-optimal realist* or *fake individualist* groups (those who perceive themselves as possessing all the skills but who do not actually possess them). As a consequence of over forty years of communist rule, in which the huge scale of production, the ratchet system and the 'Macawber principle' produced an economy not well disposed to the development of entrepreneurial skills and values. Networking was advocated as a public policy model which would be conducive to the environment of fiscal crisis in Eastern Europe which has resulted in severely restrained government spending. In the model, skills were to be disseminated naturally through co-operation within the market rather than by relying on government spending.

However from the model presented it became clear that networking as a strategy would be severely limited where the individual small business owners possess homogeneous skills or

no skills at all. Effective skill dissemination depends upon the interaction of heterogeneous rather than homogeneous actors. In Eastern Europe the command economic system has led to an inheritance where many of these essential skills, such as marketing, are either not present or only present among a small number of individuals. The all encompassing hierarchical decision making process promoted uniformity rather than diversity in managerial organisation, which meant that the necessary range of skills were not present. There now exists neither the quantity of skilled entrepreneurs nor the diversity of business skills necessary for the networking option to become viable. These problems are compounded where regions are underdeveloped, as their very underdevelopment makes it difficult to accumulate the information required to facilitate the development of beneficial entrepreneurial networks (Oakey, 1993).

Thus it was argued that networking could not be seen as an appropriate means of promoting SME development. More attention needed to be focused on establishing the appropriate conditions for small business networks before such networks could become viable as a way of improving Eastern European SME business skills. The success of networks will be strongly dependent upon the quality of the initial inputs (the individual skills of owner-managers and the supply side profile). In this light, the fact that the most prominent and successful SME networks- Silicon Valley (Saxenian, 1990) and Cambridge (Keeble, 1989) also have the highest quality of inputs is entirely predictable. This being the case, attention in the long term needs to be given to the design and funding of relevant training schemes which will improve the initial 'input' skill base. In the Eastern European example cited earlier, where network heterogeneity is low, training represents the most efficient solution, even in the short term.

The nine skill classification outlined above is not restricted in its use to the Eastern

European context. Rather it is offered as a analytical tool for assessing skill heterogeneity within any environment, be it a country, industry, or sector. By identifying skill possession in this way, it is possible to maximise efficiency by allocating funding to those actors, firms and networks which are most likely to benefit.

Heterogeneity assessment thus represents the first filter in identifying entrepreneurial firms most likely to network and accrue competitive advantage and growth through their networking activities. Additional means of targeting, funding and support system activities will be proffered throughout the text. From these a public policy model will be identified which can be used to identify, nurture and develop the firms best equipped for future growth and job provision.

2.52 Networking Motivation

Murray and Mahon (1993: 104) in their work on strategic alliances (a formal, high intensity network) identify two fundamental motives for participation:

"a 'defensive' instinct to survive or an 'offensive' desire to achieve competitive advantage."

These basic motivations will now be considered in terms of their component parts. Their applicability will vary with intensity and formality, for this reason the table offered at the end of Chapter Five attempts to band the most likely advantages and disadvantages on the basis of their relative intensity and formality positions.

2.5.2.1 Offensive Motives

Innovation & Growth

Although the growth motive can be challenged, at least as an overall explanation encompassing all owner-managers (Stanworth & Curran, 1973; Silver, 1993), it is valid for some members of this group; in particular those individuals whose decision to establish their own business extends beyond needs for decision making autonomy, self sufficiency or creative freedom.

Oakey (1993) suggests that firms that enter into subcontracting relationships with larger companies in a competing market, are in reality constraining their growth, as opposed to stimulating it as they might have hoped. The dominant firm in the network, he maintains, benefits by effectively containing the ambitions of a potential competitor, as well as

gaining in the short term from a source of independent production and innovation.

Substantial growth gains can, however, be secured through co-operation. Notable examples can be found in high-technology (Silicon valley, Cambridge science park) where a number of competing firms are concentrated in a given geographical area.

Access to external resources

The most obvious form of competitive advantage (Porter, 1980) can be derived from access to and utilisation of resources which would normally be considered external to the firm. Networking activity will be notably intense at business start up (Johannisson, 1986) when it often represents the only means of conducting business. Network dependency will be high during the early stages of business development, as the firm lacks the reputation and size needed for support or funding from actors outside of their networks. In these early stages the network represents a safety net, protecting the entrepreneur from the brutality of the market (Johannisson 1987b).

Source of Information

Competition exists because actors entertain the belief that they are in some way capable of providing a product or service more successfully than other operators. Access to information frequently represents a source of potential competitive advantage. This is particularly the case where market volatility and uncertainty are high. Increased access to information, can therefore be seen as both an offensive and defensive action on the part of the owner-manager, enabling them to make superior judgements about the environment as a whole. Bridgewater (1992) suggests that information passes most effectively through

strong inter-firm linkages, and this information exchange acts as a catalyst in the development of new products.

A Means of shortcutting bureaucracy

The networking concept has proved surprisingly popular with both theorists and practitioners in Scandinavia. Doubtless an element of its success, certainly in Denmark, can be attributed to the high capital injections accompanying the programmes. Johannisson (1986) suggests another element. He argues that utilisation of personal linkages is the only method available by which owner-managers can bypass the bureaucracy inherent in a 'negotiated economy'. Firms that network in such environments therefore benefit from a significant time advantage when competing with competitors who are not networking in this way.

Access to New Markets

Network ties can represent, in some instances, a useful means of gaining access to non-local markets especially if intensity is high (Bridgewater, 1992). In these situations members may represent both a valuable source of information on market trends and a source of additional capacity where demand exceeds internal supply. Horizontal co-operation can also be used as an instrument for opening or exploiting new market segments (Larson, 1991), which are impractical for a single firm on the grounds of size, risk or profitability.

2.5.2.2 *Defensive Motives*

A means of reducing uncertainty

It can be argued that the most significant defensive motive for network participation is control of the external environment. By gaining greater control (access to resources) or understanding (information) about the environment, the owner-manager effectively reduces the level of uncertainty that their organisation is subjected to. Uncertainty and networks have been discussed in some detail by Hulten and Lundgren (1986). They argue that the level of success that a network enjoys with respect to uncertainty reduction, is a function of the efficiency with which they exchange information, the strength of linkages between the firms, the number of unhealthy relationships and their relative importance within the network.

The success of uncertainty reduction, they suggest, is dependent on the uncertainty strength and its form: structural or dynamic. Loosely linked homogeneous networks are best equipped for strong structural uncertainty and loosely linked heterogeneous networks for strong dynamic change.

Such actions are however not without consequences, and the network medium may due to the level of interdependence between participants act to:

"reduce some types of uncertainty and enhance other types." (Hulten and Lundgren, 1986: 7)

A certain level of uncertainty is unavoidable in business, and it is this uncertainty and the risk which is derived from it that legitimises the entrepreneurial role and the profit gained.

Attempts to control risk result in similar uncertainty elsewhere within the environment.

"the individual's uncertainty is more or less a function of the development, or put another way, the cumulative circular flow of the industry. In the circular flow, individuals, through their actions, push the system in one direction or another. When they do this they impose new uncertainties on the other actors in the industry." (Hulten and Lundgren, 1986: 6)

Only Option

As has been stated above the network may in some circumstances represent the only method through which business can be conducted (Johannisson, 1986). It may also be used as a survival tool, or as a means of rejuvenating the firm (proactive networking). Proactive networking is used extensively during organisational start up (Birley & Cromie, 1988) where it frequently represents the only means of accessing essential resources, service or advice (Johannisson, 1986).

Access to Markets

The increasing trend towards the internationalisation of world markets has resulted in extensive competition in all industries and market niches. This global trend has forced SME owner-managers into accepting greater specialisation, and with it, increased risk.

Networking presents a potential solution to this dilemma. The networking owner-manager can utilise a foreign contact as a distributor. By networking in this way the OM benefits from an increased market for their products, as well as risk bearing and production economies of scale. In addition to this, the contact is able to draw upon knowledge about the local market environment and social culture, with far greater confidence than the

owner-manager themselves (Bridgewater, 1992; Hakansson & Johanson, 1988). In other markets foreign competition may be prohibited or heavily penalised against. The network may therefore represent the only means of getting the goods to market. Johannisson (1986) refers to this as legitimisation of non-local markets.

Flexible Mode of Organisation

This point is elucidated by Bridgewater:

"Change, more especially, innovative adaptation is the lifeblood of the network. This ability constitutes its major advantage as a flexible organizational mode. A key feature of the network is that it can be disaggregated and, in reforming, metamorphose to meet any given market situation. Consequently, Hakansson (1992) finds within networks the need for 'heterogeneity', the ability to find new ways of combining activities and resources (...)"

It is important to remember motives will vary between actors and the above should therefore not be considered as a definitive list. It is clear that the rationale for participation will vary with, amongst other factors, the nature of the market, the nature of the product, the outlook of the actors, nationality and the nature of the customer supplied.

When considering the potential costs of co-operation one finds the main reason identified for not entering into high intensity network relationships appears to be the risks involved in co-operation stemming from the greater dependencies entailed therein, and the threat to the firm's autonomy. Greater dependency on other actors brings with it the fear that if other actor(s) defect, substantial losses will be incurred by the co-operative party(ies).

2.6 Commitment, Trust and Opportunism

Evidence presented in previous sections might suggest that the network structure is a panacea for all corporate ills, and a remedy to resource deficiencies of all types, however, this is simply not the case. Presentation of such an argument is thus both naive and myopic. This section is therefore concerned with the general hazard of risk through co-operation, whilst section 2.7 seeks to identify circumstances in which co-operative ventures should be avoided, and examines the costs and disadvantages which are commonly associated with networking *per se*.

Although there are a number of factors which may dissuade actors from participating in a co-operative venture, the most frequently cited reason for not entering into these agreements (most particularly high intensity network relationships) appears to be the risk associated with the greater dependencies they entail. Increased reliance on other actors brings with it the fear that if other actors defect, substantial losses to the co-operative party(ies) can occur. This situation can be modelled using the Prisoners Dilemma Game Theory analysis.

2.6.1 The Prisoners Dilemma

While a rationale for co-operation can be advanced between complementary but heterogeneous actors (Teece, 1986; Kay, 1992) this does not mean that it will occur in the free market. While long run benefits may be obtainable from co-operation there will be short term risks associated with the possibility of the co-operating partner(s) defecting. Such a situation can be modelled using a prisoner's dilemma game theory approach (McLean, 1990), see Figure 2.5.

Figure 2.5 - The Prisoner's Dilemma

		PLAYER 2	
		Co-operate	**Defect**
PLAYER 1	**Co-operate**	**REWARD** R, 10	**SUCKER** S, -10
	Defect	**TEMPTATION** T, 20	**PUNISHMENT** P, 0

Source: Derived from Axelrod (1984)

Let us suppose there are two high technology firms 1 and 2 who would benefit from pooling knowledge and research development - so that the individual returns from co-operation (R) are greater than the pay-offs for non-co-operative individual development (P) (both defect). However in a one off game the best return for 1 is if 2 gives it all its knowledge and expertise but bestows nothing in return (2 co-operates and 1 defects, with 1 getting the temptation reward T). In contrast, the worst return for 1 is if it gives away all its knowledge but 2 returns nothing (1 co-operates and 2 defects, with 1 receiving the sucker pay off S). The four possible pay-offs can thus be ranked in order (Lange, 1984) (see table 2.1)

Table 2.1 - Preferred Strategies and Their Pay-Offs (Single Game)

Firm 1	Firm 2	Pay-Offs for 1	Numerical Reward for 1
D	C	T	20
C	C	R	10
D	D	P	0
C	D	S	-10

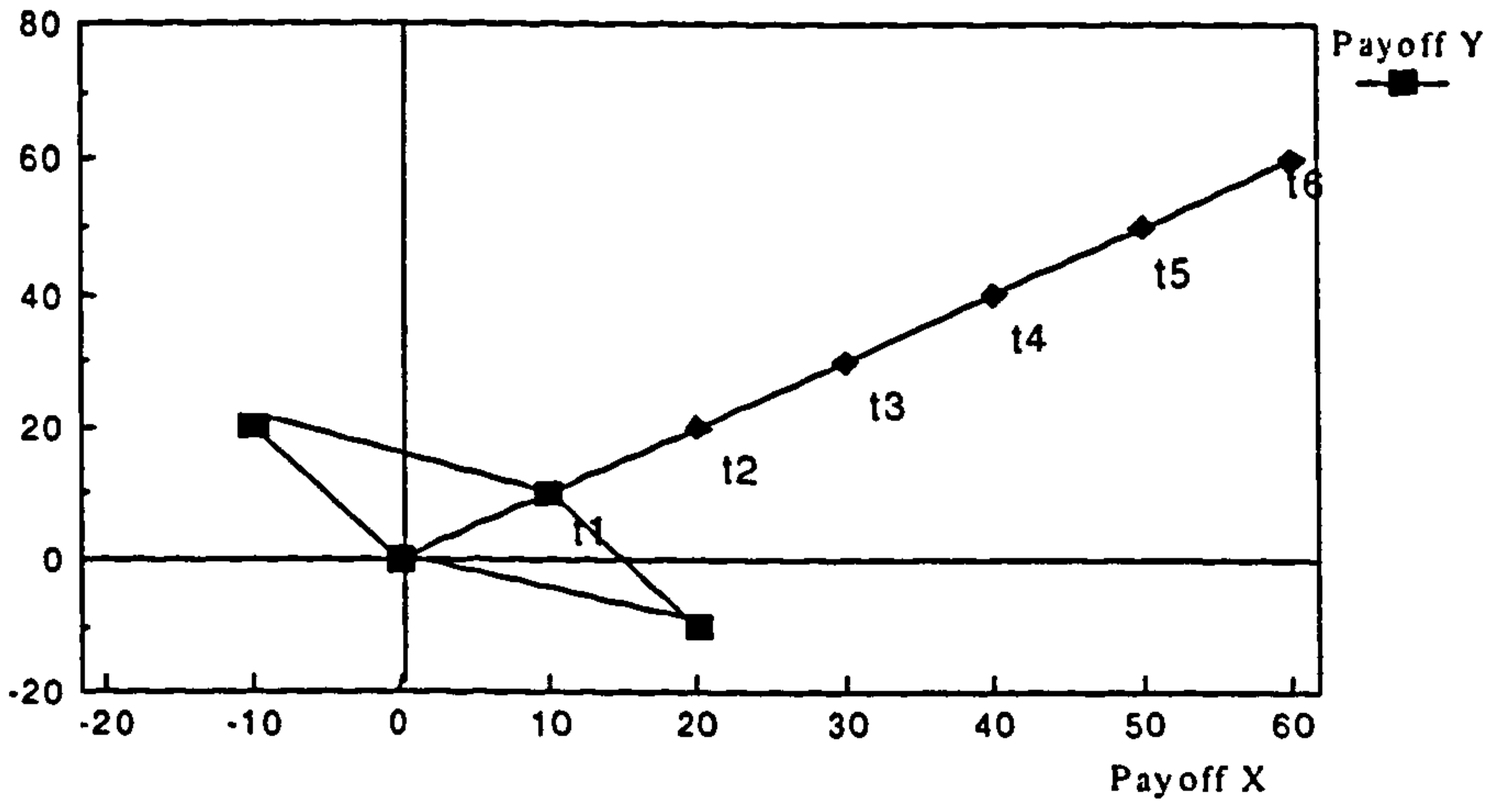
where: $T>R>P>S$

$(T+S)< 2*R$

In a one-off game there is thus a strong likelihood of both parties defecting to avoid being suckered, so that beneficial co-operation is forgone. In this case mutual defection is rewarded with the punishment pay-off. This is a form of market failure - individuals through pursuing their own individual gains and interests produce a collectively sub-optimal economic outcome ($P<R$) (Schotter, 1990).

If the game is played more than once (supergame scenario) constant defection will see repeated collectively sub-optimal outcomes. Given that the pay-off structure above is constant the repeated playing of the game will reward those players who co-operate with each other every time they play, while the opportunity costs of those who mutually defect will accumulate. With repeated benefits from long run mutual co-operation, the potential losses increase from defecting from someone else who will then no longer co-operate in future games (see Figure 2.6)

Figure 2.6 - Prisoner's Dilemma - Supergame Pay-Offs



Sacrificing future co-operative rewards for a single temptation reward followed by punishment becomes less and less rational as the number of games played rises.

For example if firms 1 and 2 co-operate in three time periods the individual accumulated pay-off will be:

$$R+R+R = 10+10+10 =30$$

This is in contrast to a first round defection followed by repeated punishments (as the other party does not want to be suckered again) in the same three time periods:

$$T+P+P = 20+0+0 = 20$$

For six time periods the corresponding collective pay-offs are 60 (for repeated co-

operation) and 20 (defection followed by mutual defection). As more and more games are played the benefits of co-operation accumulate. In this case the threat of severing the relationship becomes the main deterrent against defection (Jarillo and Ricart, 1987).

Given this framework, to obtain the benefits of co-operation there is thus a clear need to foster long term beneficial relationships and a climate of trust and commitment. Collective benefits depend therefore on a collective stable state (CSS) of co-operation rather than mutual defection.

2.6.2 Trust and Commitment - Network prerequisites

A need for trust is inherent in any business relationship, but it is particularly vital to the success of a network where its absence acts to increase the probability of actor default, and 'sucker punishment' for the co-operator. It is only through the development of trust that the win-win situation can be achieved, and alternatives to the sub-optimality of the market place can be found. Despite being cited as a source of competitive advantage (Day, 1991; Glazer, 1991; Porter & Millar, 1985), the concept of trust still remains largely unexplored. Moorman, *et al.* (1993) identify two dimensions of trust, both of which have been advanced independently elsewhere. The first dimension (affective trust) is an assessment of an individual's trustworthiness, and is based on his/her ability, dependability or intentions (Moorman, *et al.* 1993: 82; Blau, 1964; Rotter, 1967; Schurr and Ozanne, 1985). Other researchers (Coleman, 1990; Deutsch, 1962; Schlenker, Helm & Tedeschi, 1973) have placed emphasis on the operationalisation of an individual's trustworthiness. Belief in the existence of trust is they argue in itself not enough. It is only when the relationship includes elements of vulnerability (Deutsche, 1962) and uncertainty (Coleman, 1990) that trust can really be said to exist. If these two elements are not present, the individual holds nothing

more than a favourable disposition towards the other party. This principle can be demonstrated through use of the prisoners dilemma game (PDG). If trust is taken as being totally encompassed in the affective dimension, the actors are not actually playing the PDG at all, as neither stands to gain or lose as a result of the other's attitude towards them. However, where vulnerability and uncertainty are present, trust becomes of paramount importance. If an actor defaults in a situation where trust represents the only safeguard, the results (for the co-operating party) can be catastrophic. Moorman, *et al.* (1993) advocate the use of *both* the attitudinal and operational dimensions:

> *"a person who believes that a partner is trustworthy and yet is unwilling to rely on that partner has only limited trust. Further, reliance on a partner without concomitant belief about that partners trustworthiness may indicate power and control more than it does trust." p. 82*

Although the results of Moorman, *et al's* (1990) study can only strictly be applied to market research relationships (the population from which the original sample were drawn) the findings do have at least indicative value outside of this field. The more pertinent findings are therefore restated here. Correlation's were identified between trust and: integrity (0.62), willingness to reduce uncertainty (0.32), confidentiality (0.26), expertise (0.19), timeliness (0.08), researcher power (0.08) and congeniality (-0.10). Individuals responsible for the establishment and management of networks should be aware of these factors when developing OM trust. Particular attention should be given to the importance of broker / facilitator integrity and expertise, both of which should be used as criteria for assessing potential network brokers. The broker and network members should also be aware of the network's need for confidentiality, and reduced situational uncertainty, as both of these factors may prove to be vital to the development of interpersonal trust.

Fells (1993) argues in favour of a context specific conceptualisation of trust. In the

negotiation relationships on which his work is based, actors favoured a reactive as opposed to proactive approach to trust development. There is no reason to believe that negotiation relationships are in any way unique in this respect, facilitators must therefore actively develop network trust, rather than wait for it to occur naturally.

As has been stressed earlier in this chapter individuals will not always act opportunistically. Prisoners dilemma game theory has demonstrated the rational economic reasoning behind co-operation, and the benefits for all parties of long term co-operative agreements. Although the literature on trust is itself still in its infancy, it does succeed in demonstrating the relevance of trust to the network paradigm, and the consequent need for its consideration in the construction of any model seeking to rationalise the network process.

John (1984) examines the affective dimension in his work on marketing channels. Building on Ouchi's (1980) earlier work on attitude normalisation he finds that bureaucracy alone represents an inadequate barrier to opportunistic behaviour. It is, he argues, only when a formal structure is combined with the creation of a 'social contract' (Rousseau, 1976) and shared values that opportunism will be minimised. Bureaucracy without 'the web of norms, attitudes and perceptions that constitute the social contract' (John, 1984: 287) acts to increase opportunistic behaviour rather than decrease it as one might expect (John, 1984). The multidimensional nature of the co-operative paradigm is recognised by Robicheaux and Coleman (1994) who point to the inadequacies of explanations volunteered by: the economists, who stress transaction cost (Williamson, 1985); relationship marketeers who concentrate on socio-political factors influencing the buyer-seller dyad (Dwyer, Scurr & Oh, 1987); and the political economy paradigm (Stern & Reve, 1980) which considers both the previous schools economic and socio-political aspects in terms of their internality (factors operating within the channel) and externality

(factors operating in the environment in which the channel is operating). Robicheaux and Coleman (1994) find merit in each of the three paradigms, combining them in their own model of channel relationship and structure. (See Figure 2.7). This represents a valuable first step in the amalgamation of existing literature in this field, which has in the past neglected many of the relevant aspects, in favour of advocation of the authors own discipline. This model is limited however, by its input (antecedents) - output (consequences) nature, which fails to consider the way in which the variables interact. Morgan and Hunt (1994) have sought to address this issue in their Key Mediating Variables Model of Relationship Marketing (See Figure 2.8). The model identifies a number of relationships between the variables. Positive correlations (as shown by a '+') can be found between the existence of shared values and trust; relationship benefits and commitment, and so forth. Conversely, a negative correlation exists between trust and uncertainty. The Key Mediating Variables in all cases (with the exception of coercive power) are trust (which has been discussed above) and commitment to which I will now turn.

Morgan and Hunt (1994: 23) find relationship commitment existing anywhere where:

"an exchange partner believing that an ongoing relationship with another is so important as to warrant maximum efforts at maintaining it."

This definition is concurrent with the earlier work of Moorman, Zaltman and Deshpande (1992) where the objective of continuance was found to be an essential component of actor commitment.

The commitment literature identifies three key subdimensions: continuance (Becker, 1960; Stevens, *et al.*, 1978), affective (Buchanan, 1974; Porter, *et al.*, 1974; 1976) and normative.

Traditionally the literature has placed emphasis on the continuance dimension - where the individuals commitment to the organisation is taken as being economically based, and a function of 'side bets' (Becker, 1960) as expressed in terms of time and money invested in the firm or project. Various attempts have been made at measuring this component (Hrenbiniak & Alutto, 1972; Ritzer & Trice, 1969), but subsequent validation exercises have found them lacking, at least as a measure of continuance commitment. Meyer and Allen in their 1984 review, find that both the Hrenbiniak-Alutto and the Ritzer-Trice scales are in reality sounder measures of the affective dimension than they are the continuance component for which they were constructed. Furthermore they express doubt in their review over the previously accepted link between age and tenure, and 'side bets', questioning the validity of their use as side bet indicators:

> *"some costs associated with leaving will increase over time (for example, noninvested pension plan contributions, seniority privileges, organization-specific training). Others however, may actually decrease. Younger employees, for example, may be particularly sensitive to the fact that, with less work experience, they often have fewer job opportunities. (...) Given that some side bets may increase, while others may decrease over time, using age as indexes seems less appropriate than directly obtaining employees' perceptions of the size and importance of investments they have made." (Meyer & Allen, 1984: 377-378)*

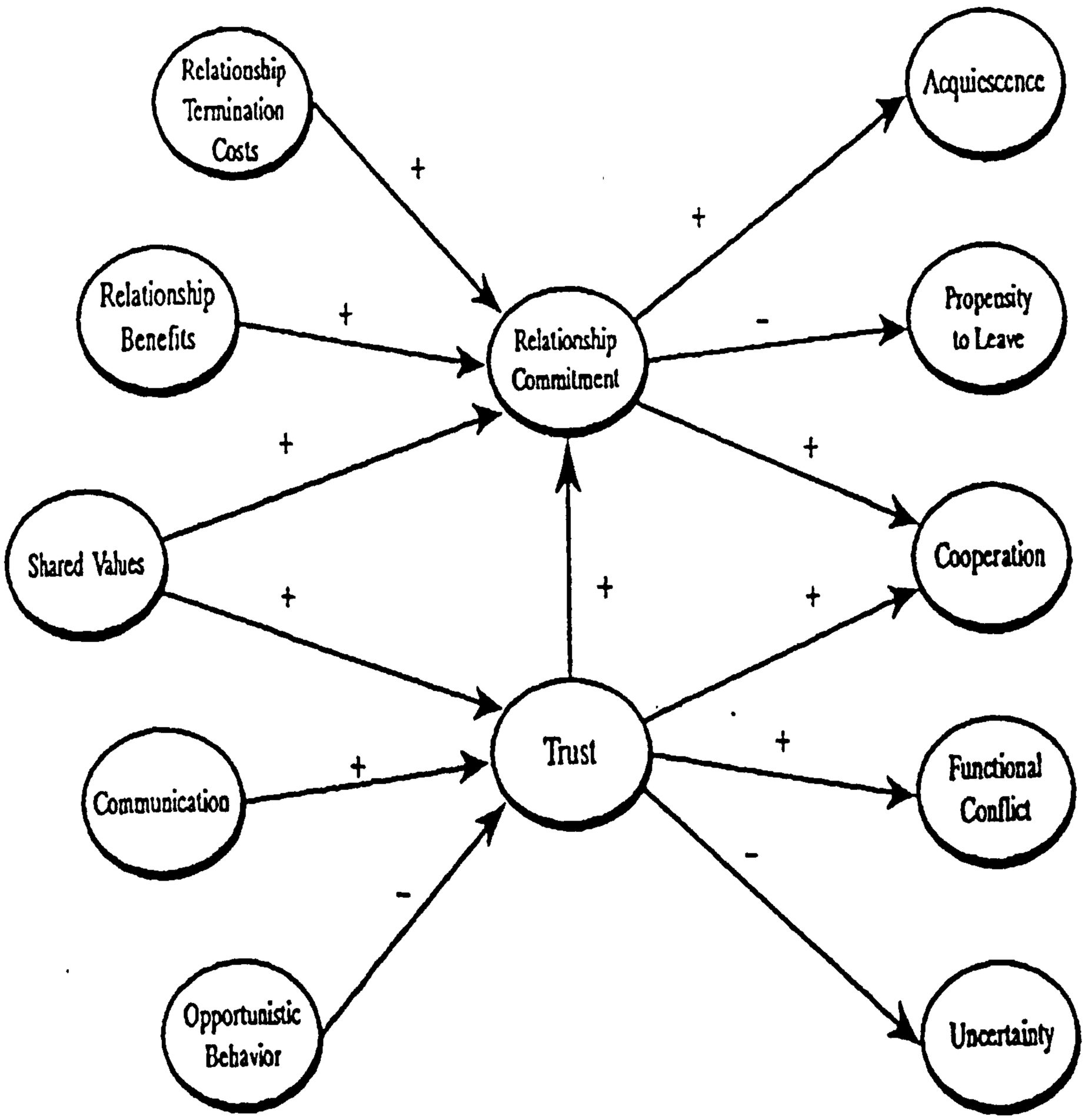
The second dimension, affective commitment, is defined as the individual's identification with, and involvement, in the organisation (Mowday, *et al.* 1982: 27). Mowday, *et al.* (1990) identify three component factors which make up this dimension: belief / acceptance of company values; effort maximisation whilst at work and intention to stay with the organisation (Mowday, *et al,* 1979). The Hrenbiniak-Alutto scale, Ritzer - Trice scale and the 'Organizational Commitment Questionnaire' ((OCQ) Porter, *et al.* (1974)) have all been identified as acceptable indicators of affective commitment. Of the three the OCQ has emerged as the most reliable (Meyer & Allen, 1984). The final dimension (normative) *"describes a process whereby organizational actions (...) as well as individual*

predispositions lead to the development of OC (Wiener, 1982)" (Mathieu & Zajac, 1990: 172). Mathieu and Zaltman suggest that the normative dimension be subsumed into the other, and in their own study consider commitment in terms of only two dimensions affective and calculative (continuance).

In recent years movement has been towards an integrative definition of commitment (Dunham, *et al.*, 1994), which views the dimensions as interdependent (Mathieu & Zajac, 1990), and attempts to test for all of them within the one questionnaire. The questionnaire developed by Allen and Meyer (1990) has been assessed as a analytical tool for examining this multidimensional commitment construct (MDCC) (Dunham, *et al.*, 1994: 376). Dunham, *et al.*, (1994) in their analysis of the MDCC find it to be a reliable measure, although minor suggestions are made for its improvement.

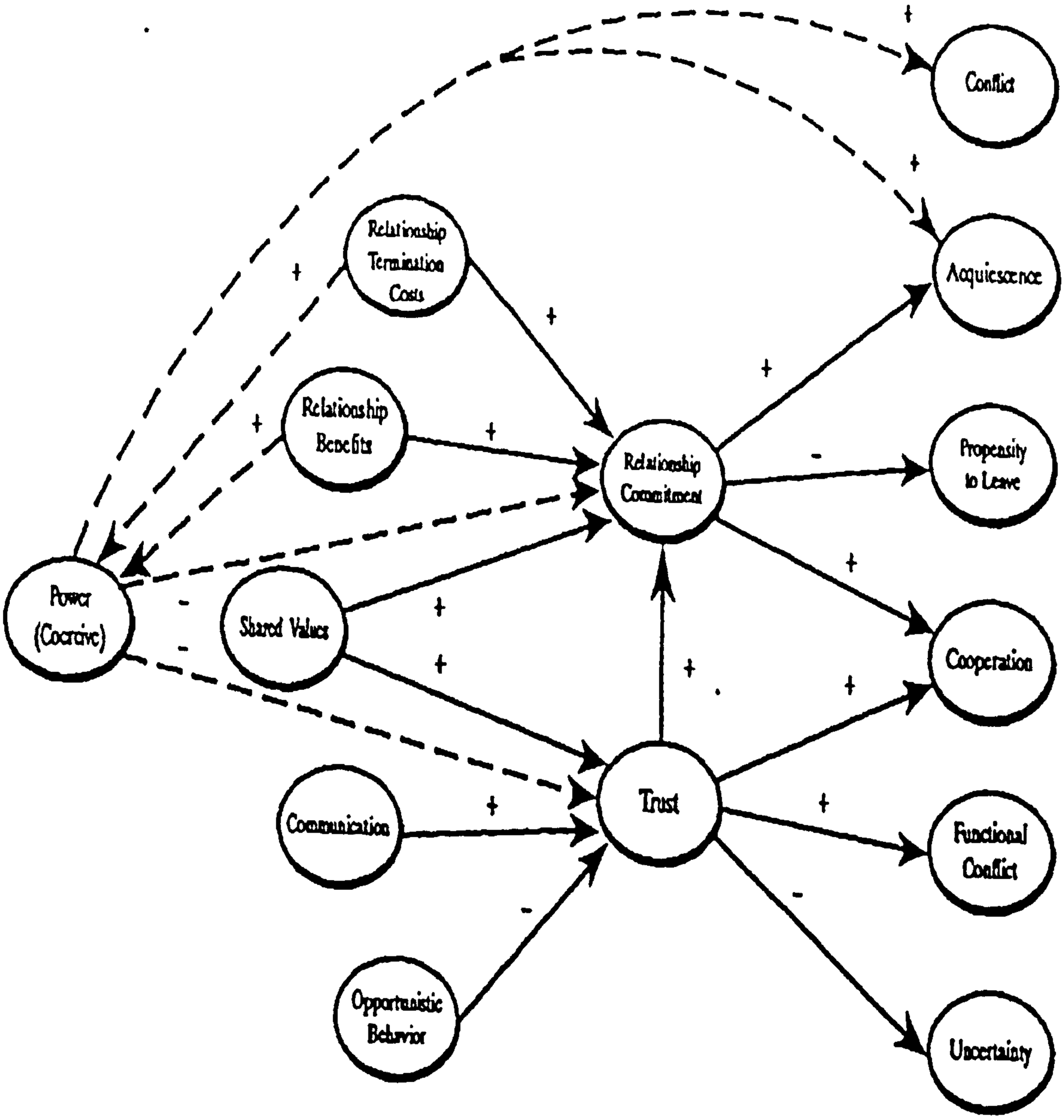
Although a number of studies have been conducted into the antecedents, correlates and consequences of organisational commitment (for a more detailed review of these see Mathieu and Zajac, 1990), only the most relevant, Hollenbeck, *et al.* (1989) is discussed here. In their study of American students, Hollenbeck, *et al.* (1989) established a relationship between grade point averages and commitment. Two sets of variables were examined: situational, comprising goal publicness and goal origin and personal, encompassing need for achievement and locus of control. Significant correlations were shown for goal publicness, need for achievement and locus of control, but not goal origin. Although questions can be raised over the use of student samples as indicators outside of the university context (Robinson, *et al.*, 1991), these findings are not without indicative value, and would suggest that need for achievement and locus of control measures may be valuable commitment indices. Thus by examining entrepreneurial personality traits it should be possible to draw conclusions relating to the individuals likely level of commitment to any given project (*ceterus paribus*).

Figure 2.7 - The Key Mediating Variables Model of Relationship Marketing



Source: Morgan & Hunt (1994: 22)

Figure 2.8 - An Extended Key Mediating Variables Model of Relationship Marketing



Source: Morgan & Hunt (1994: 33)

2.7 Relationship Marketing and the Industrial Marketing and Purchasing Group

2.7.1 Relationship Marketing - An Introduction

The following section provides a brief introduction to the work of the Industrial Manufacturers and Purchasing (IMP) Group . The review of the literature seeks to achieve two broad objectives. To identify theoretical overlaps between the IMP and general networking literature, and to discuss pertinent literature which makes points not found elsewhere in the networking literature base. A review of the literature in this way acknowledges the fact that for the most part these academic arenas have developed in isolation. Individuals who have published and been acknowledged in both fields have therefore been something of a rarity. The notable exceptions to this rule being Hakansson, Johanisson and Johanson.

With the above in mind attention is therefore given over to consideration of the IMP literature. Where a point is made which has been echoed in the general networking literature the authors name(s) and date of publication(s) is shown in italics.

Relationship marketing has emerged in the last two decades as a discipline which advocates strategic consideration and management of the linkages that a company has with others be they supply chain intermediaries (Davies, 1996), customers (Ford, 1998), staff or subsidiaries (Reyuoso and Moores, 1996). At its heart, relationship marketing recognises that *"No company works in isolation. Each is dependent for its survival on customers and suppliers of products and services, finance and advice* (Ford, 1998: x), and that *"relationships between buying and selling companies are frequently long term"* (Hakansson, 1982: 16). The importance of relationship marketing as a source of

competitive advantage in industrial markets has been recognised on a number of occasions (c.f. Mudambi and Helper, 1998; Langfield-Smith and Greenwood, 1998; Sharma and Sheth, 1997), Ford (1998: 5) though has gone further, in exploring the complexities of such markets: *"In business markets, we are not just dealing with active sellers who try to attract the attention of a passive market. It is not a case of action and reaction, but one of* ***interaction.*** *Sellers do seek out buyers and try to influence them to buy. However, buyers also have to search for suppliers that can and are prepared to meet their requirements, which may often be complex or idiosyncratic"*.

The benefits of developing a customer-centred approach in buyer-seller relationships are readily recognised (c.f. Evans and Laskin, 1994). Buttle (1996: 5) in reviewing the literature states that *"it has long been claimed that it is between five and ten times as expensive to win a new customer than it is to retain an existing one* (e.g. *Rosenberg and Czepiel, 1984).*" Or as Ford (1998: 151) has put it *"No customers, no business - no business no job"*. For the buyer too, benefits from the development of such relationships have been shown to exist, with Larson and Kulchitsky (1998) finding that single supplier sourcing and certification provides buyers with higher quality goods or services at a lower total cost. Similar arguments for closer relationships between other parts of the supply chain can also be extended (c.f. Davies, 1996).

2. 7.2 Buyer-Seller Relationship and the work of the IMP group

Although much of the work conducted by the Industrial Marketing and Purchasing (IMP) group has been considered earlier in this review (c.f. Hakansson, 1992; Hakansson and Johanson, 1988; Hulten and Lundgren, 1986) this is an area of the literature which is worthy of explicit, individual consideration. IMP researchers like their transaction cost

based counterparts analyse intra- and inter-firm transaction based relationships, they differ though in terms of the unit they use to analyse such transactions. IMP based research takes an 'actor specific' approach, in which the behaviour of individuals involved in the buying-selling process is used as a means of understanding transaction activity and results.

For the most part, until recently, the work of the IMP group has centred around so called 'buyer-seller' relationships. Their work in this area (although it has been extended to encompass other types of relationships in recent years (c.f. Ford, 1998)) should be viewed as part of the larger discipline of relationship marketing, which can be defined as "*the understanding, explanation and management of on-going collaborative business relationships*" (Sheth, 1994: 2 as cited by Buttle, 1996: 3). The parallel with the networking / co-operative research literature reviewed earlier in this document is clear (cf. *Powell, 1991*), and further evidence of it can be found in the work of Gummesson (1994: 12) who defines relationship marketing as "*marketing seen as relationships, networks and interaction.*"

The work of the IMP group has broadened and evolved significantly from their original interaction model (Hakansson, 1982; Turnbull and Valla, 1986; Ford, 1990) in which the focus was upon two or more parties, comprised of at least one buying firm and one selling firm. The parties involved were deemed to be interacting within an atmosphere which was comprised of both an economic and a control dimension. The economic dimension was viewed as being comprised of two parts, a component which enables the realisation of lower transaction based costs which is congruent with that of Williamson (1975; 1985) and Powell (1990); and another component in which increased revenue potential is realisable through the development of closer buyer-seller relations. The control dimension is in essence a means of reducing environmental uncertainty (Ford, 1998: 19; *Hulten &*

Lundgren, 1986), by interacting more closely with other firms it becomes possible for a firm to more accurately predict changes in their environment, and thus react positively towards them. A buying organisation which demands exclusive supply increases the dependence of the selling firm upon it. With this dependence comes an increase in the level of power which can be wielded upon the dependent firm and as a result an increase in the buyer's ability to predict their likely behaviour. Relationship power has been discussed at length in the mainstream networking literature, e.g. Cook 1977, 1979.

Within this atmosphere Ford (1990) identifies four elements which can be exchanged between participating parties: products or services, information, financial (money) or social elements. The first three that he identifies are self evident and will therefore not be discussed in further detail here. Social exchanges, however, though require further consideration. Continued social interaction between firms and the personal experience of each other that comes with it, will lead to increased mutual trust. The importance of trust in the exchange process will vary in line with the value of the item(s) being exchanged. Where the item is valuable either in monetary terms, or in terms of its usefulness / necessity to the firm(s), the need for mutual trust will be understandably higher.

The interaction atmosphere and process is conceptualised as being contained within the interaction environment. Consideration of the environment recognises the fact that interacting firms are not acting and therefore cannot be evaluated in isolation. Ford (1990) identifies five factors within the environment which impact upon firms and can determine the way in which they behave towards one another: the structure of the market; the level of dynamism which exists within the inter-firm relationship(s), the degree to which the interacting parties market is changing will affect inter-firm relations. A high level of change within the market may mean that closer relations result in inflexibility.

Alternatively, in an oligopolistic market in which the number of competitors is low and change infrequent, such interactions may act to increase interacting firm's ability to forecasts future market behaviour); the extent to which the market could be said to be internationalised (and thus the level and quality of the competition faced); the position of the interacting firms within the manufacturing channel (the further down the manufacturing channel a firm is the more dependant upon other firms they are) and the social system in which the firms are interacting (this represents a recognition of varying cultural attitudes towards individual countries, industries or companies).

Under the IMP model purchasing is therefore *"seen as an external resource by the buying firm. The buyer's aim in relationships is to use these external resources in an efficient way. But in order to be attractive to a counterpart, also has to have some internal resources, One strategic purchasing question therefore, is to find and maintain a balance between the external and internal resources."* (Ford, 1990: 22)

Turnbull (1979) takes this model a stage further by focusing upon individuals within the interacting firms. The complexity of industrial markets and the resultant bias towards personal selling, he argues necessitates the development of personal contacts. Interaction between these individuals he suggests acts not only as a conduit for information exchange (a point which has been subsequently articulated in the mainstream networking literature by Bridgewater (1992)), but is often used to modify the product supplied, the means and speed with which it is delivered and through negotiation frequently its price. Although the 'selling' element of the exchange process is frequently formalised and as a result regulated the other components of the interaction (e.g. information exchange) are not. Better management of the interaction process and the management of personal contacts will Turnbull (*op. cit.*) argues, lead to increased efficiency and profitability.

The importance of information in inter-firm relationships is also recognised in the work of Harland (1996: 69). He takes as a starting point the work of Smith *et al* (1963) who state that purchasers assess suppliers performance in terms of their ability to supply the required quality, delivery and price. Harland's (1996: 77) own empirical research into supply chain relationship management identified buyer-seller misperceptions about performance, as being more pronounced in upstream relationships. Levels of customer dissatisfaction were also found to be more significant in upstream relationships. The relationship between customer dissatisfaction and performance misperceptions was found to be significant at the one percent level.

2.7.3 Relationship marketing and the importance of trust, commitment, power and conflict

Other work by IMP researchers has sought to use or test this interaction model within alternative or more complex contexts. Hallen *et al* (1987) identified a statistically significant relationship between relationship strength and its stability. When export relationship were tested, however, there was no relationship between strength and stability. Hakansson (1993) in his study of 49 research and development agreements based in four Scandinavian countries found that the probability of co-operative success increased where prospective partners had had prior contact with one another. This outcome provides empirical support for the arguments of Wilson and Mummalaneni (1986) who suggest that *"Instead of focusing on discrete purchase acts, we would do much better making the buyer-seller relationship the appropriate unit of analysis. In other words, if we wish to*

focus on buyer-seller transactions, these transactions must be analysed in the context of future as well as past transactions."

Theories relating to power and conflict have long been advocated as theoretical determinants of relationship success (c.f. Hakansson, 1982: 21). Gemunden (1985: 56) though has indicated the importance of 'honest' conflict in buyer-seller inter-organisational relationships, arguing that actors involved in the management of such relationships *"should consciously fight out these conflicts in an open manner"*, but emphasises that they should *"restrict these activities to the decision stage"*. Moore (1998) in his empirical study into logistics alliances presented contrary results, where conflict had a more negative influence on relationship developments, relationship commitment and relationship effectiveness.

Trust and commitment, as has been discussed at length earlier in this review in the context of networks (*Morgan & Hunt, 1994; Moorman et al, 1993; Hollenbeck et al 1989*), have been recognised as being key determinants of inter-firm relationship success. Geyskens *et al* (1998) in their meta-analysis of trust in marketing channels, found it to be one of, if not the key factor, in determining relationship satisfaction and long term sustainability. Smeltzer (1997) has argued that within a buyer-supplier relationship, trust is essentially concerned with not being entirely self-serving. He states that a firm assessment of the trustworthiness of other firms originates from their assessment of their image, reputation and identity.

Ford (1998: 27) has demonstrated the importance of relationship *adaptation* which can be seen as a proxy for commitment, as a process through which firms *"treat a particular [buyer/seller] in a unique way."* Others have looked at the affect of specific commitments / adaptations within buyer-seller relationships. From the results of their empirical study

Stump and Sriram (1997) found that IT investments enhanced such relationships, and led to a reduction in buyers supplier bases. A contrasting view though can be found in the work of Burgess and Gules (1998), who in their study of advanced manufacturing technologies in the Turkish automotive industry argued that so called soft technologies, such as organisational procedures and management were far more significant determinants of buyer-seller collaboration than 'hard technology' adaptations.

The commitment of others has also been shown to affect the commitment of individual firm or actor within buyer-seller relationships. Doucette's (1997) survey of retail pharmacies showed that where the perceived commitment of other members of a group purchasing organisation was seen to be low, the commitment of respondents was also low.

Where a relationship of trust and commitment does exist actors and firms involved should not be complacent. Minahan (1998) stresses that nothing is guaranteed, and suppliers in particular must seek to build upon the strengths which led to their initial involvement in the buyer-supplier relationship. In particular, echoing the points of Smith *et al's* (1963) work some twenty-five years earlier, they argue that suppliers should strive to improve their quality, performance and cost. Langfield-Smith and Greenwood (1998) in their case study of buyer-seller relationships within Toyota Australia add to this list. They suggest that longevity is only possible through effective communication between all parties involved, and readiness to change (change can be viewed here as being congruent with adaptation as outlined by Ford, 1990; 1998) in line with experiential learning within the relationship.

This section has sought in passing, to introduce the work of key researchers working within the supply chain and IMP group research fields. In terms of its scope, it has not sought to present or review all of the work of such individuals, but rather has concentrated on

discussion of relevant literature which complements the network-co-operation works reviewed earlier in this document. It should therefore be recognised that the literature bases within these fields are much larger than those presented here, and in no way is this review intended to be even a comprehensive introduction.

The overlap between, and largely independent development of the IMP and what is labelled here as the general networking literature has been demonstrated in the preceding sections, Table 2.2 is therefore presented as a means of summarising work conducted within the two bodies of literature, demonstrating as it does areas in which they complement or duplicate one another. Where an author has published work in both arenas, as is the case with Hakansson, their name is entered in the column which reflects the section in which their point has been discussed within this review.

Table 2.2 - The IMP and General Networking Literature Bodies

IMP Literature Base	Point Articulated	General Networking Literature Base
Ford (1990); Gummesson (1994); Sheth (1994); Turnbull (1979)	Management Relationships as a tool for achieving co. objectives	Axelsson & Easton (1992); Powell (1991)
Ford (1990); Hakansson (1982); Turnbull & Valla (1986)	A means of reducing transaction costs	Powell (1990); Williamson (1975; 1985),
Ford (1998)	Control / Reduction of environmental uncertainty	Hulten & Lundgren (1986)
Harland (1996); Smith et al (1963); Turnbull (1979)	A means of facilitating information exchange	Bridgewater (1992)
Hallen *et al* (1987)	Relationship strength and stability	Morgan & Hunt (1994)
Wilson & Mummalaneni (1986)	Prior contact and co-operative success	Hakanssson (1993)

Gemunden (1985); Moore (1998)	Power and conflict	Cook (1977); Hakansson (1982)
Geyskens *et al* (1998); Smeltzer (1997)	Trust	Hollenbeck *et al* (1989); Morgan & Hunt (1994); Moorman *et al (1993)*
Doucette (1997); Ford (1998); Stump & Sriram (1997)	Commitment	Mathieu & Zajac (1990); Morgan and Hunt (1994)

In addition to discussing the independent development of the IMP and general networking literature and their interdependent nature, this section has sought to provide further justification for the consideration of concepts such as trust, commitment, conflict and power as hypotheses for further investigation within this study. The next chapter reviews the owner-manager and mainstream personality psychology literature, and closes with a similar justification for the inclusion of owner-manager personality characteristics based hypotheses within this study. Such hypotheses it will be argued may well also prove to be critical antecedents to firm's network behaviour and success.

2.7.5 Implications for networks

Taking co-operation and networking as congruent, one finds evidence, as outlined above, for the study of and inclusion of both trust and commitment in any future study of business networks. *Prima facie* evidence for their use has been offered by Morgan & Hunt (1994).

The negative effects of power displays on the network, illustrates the importance of broker facilitation in the early stages. Morgan and Hunt find that actors co-operate in healthy relationships 'because they want to' (1994: 33), and continue their argument by suggesting that:

"Long-run relationship success, (...) is more likely to be associated with the absence of the exercise of coercive power and the presence of commitment and trust."

Synergic co-operative gains, can therefore only be stimulated through the development of trust and commitment. The broker or network facilitator should be mindful of this when selecting and recruiting new network members. Care should also be taken, so as to avoid coercive power displays by members, as displays of this kind will only succeed in producing actor conflict, which will lead to reduced trust and commitment amongst network members. The role of the network broker, as facilitator of an environment of trust and commitment is addressed in greater depth in Chapter Four.

2.8 The Potential Downside of Networking

Networking has been advocated as a cheap, easily implementable, effective, and comparatively instinctive means of obtaining necessary resources and operationalising organisational goals. In reality however the network concept is context specific, its potential is thus defined by the social, political and economic environment in which it is to be found. The importance of context was noted by White *et al* (1996a) in which networking was found to be inappropriate for the post-communist states of Eastern Europe. In which skill homogeneity acts to significantly dilute possible gains. Contextual analysis is therefore essential, if networks are to be implemented and / or managed effectively.

This point is illustrated further by Oakey (1993: 16) who cites the potential dangers to small firms operating in the biotechnology market where he suggests that by its very nature it forces small firms operating within it, into:

"close networking relationships with their large firm customers, which is an ideal vantage point from which the larger firm may keep a 'watching brief', with a view to possible acquisition as or when desirable internal new technology is produced in the new firm concerned."

He produces empirical data supporting this statement and notes that a high growth firm is particularly vulnerable to take-over. Eighty three percent of his sample, that could be classified as high growth companies, had received acquisition approaches (28 per cent) had been subjected to a successful or unsuccessful take-over (65 per cent) over the course of the study. As a result of this he concludes that:

"It would be naive for academics to over state the potential for industrial firms to network to mutual advantage in competitive conditions in general, and in the technologically fast moving area of high technology industries in particular." (Ibid: 20)

Oakey is perhaps guilty here of overdramatising the issue, at least at the macro-level. The biotechnology sector is not representative of industry *per se*, characterised as it is by high research and development costs. The caveat is also applicable only to vertical networks (and in particular transaction ties) between SMEs and larger corporations, where subcontracting relationships frequently present the larger purchaser with a significant power advantage. Although additional support for this argument can be found in Smith's study (1982), this caveat can for the most part be disregarded, at least in relation to SME to SME linkages in which such power and growth differentials are likely to be less significant.

Miles and Snow (1986) identify existing skill possession and competency as a double edged sword, which both enhances and constrains the development of network members. Mattsson (1989) develops this reasoning further stating that an actor's initial position within the network dictates future positions and resource availability (Hakansson & Johanson, 1988). Strategic planning and implementation thus becomes a network-wide consideration (Axelsson, 1992), as plans implemented at the micro (firm) level may result in future uncertainty across the network as a whole (Hulten & Lundgren, 1986).

Networks, at least the instrumental variety, demand reciprocity by definition. Requests for aid may therefore be heard at any time, not just during slack trading periods or times of convenience (Johannisson, 1986). Actors intentions will not always be honourable, and ulterior motives for involvement are a factor which needs to be considered. Network participants should then be aware of the existence of unhealthy relationships (Hulten & Lundgren, 1986) when introducing or accepting a new member.

Networking is also perceived by some as being antithetical when compared to normal SME practice, where autonomy is thought to be paramount (Macmillan *et al,* 1990; Bevan *et al* 1989; Curran, 1987; 1986; Scase & Goffee, 1982). This statement is refuted by Johannisson (1990) who suggests that the informal nature of networking contrasts significantly with formal co-operation, as it affords participating actors with discretion, with which to choose their dependencies. There are however OMs who value their autonomy above all else; these individuals are not likely to be natural networkers, and will, it is argued, avoid voluntary ties wherever possible. This point will be developed in greater depth in Chapter Three.

When forming a network, participants should be conscious of the need for purpose and direction in their activities. Inappropriate members will confer no benefit on the network, and may have an adverse affect on network results (Jackson, 1985). If the network is not seen to produce results or profits the probability of actor defection is increased (Morgan, 1991). Strategic planning and control at the network level is then clearly an issue, and responsibility for this and other functions should be established at an early stage in network development. This argument is supported by Mattsson (1989) who notes the greater efficiency of stable structured networks, as compared to loosely structured networks, in which ties were not as strong. Heterogeneity and diversity are also important, and actors should be careful to avoid excessive dependence on advice administered from a single source. Casrud (1986) supports this view, and finds strong or single ties as exemplified by mentors as a potential constraint on firm development, with task ambiguity and changes in network members, and / or their roles acting to reduce anticipated gains.

Johannisson (1986) stresses the importance of actor personality, which is reflected in the way in which individuals form and operate their network. Linkages can be seen as an

extension of the actors themselves, and for this reason business succession frequently results in network breakdown, as changes in personality and the removal of a trusted contact increase strain on the predecessor's relationships. This stress is amplified in high intensity informal relationships in which the costs of defection are high, and where trust and a history of interaction often represent the only security for their members.

Empirical research conducted in the high technology markets has for the most part acted to support theoretical claims on the potential drawbacks of networking: loss of autonomy (Barley *et al*, 1992), potential for unplanned loss of knowledge (Nueno & Oosterveld, 1988), difficulties in allocating resources (Biemans, 1992; Wissema & Euser, 1991), integration of individual R&D departments (Biemans, 1992), and the quality of predeveloped inputs (Biemans, 1992) have all been cited as sources of difficulty. These studies are limited as their small samples and their emphasis on high technology businesses places question over their statistical soundness and appropriateness for SMEs as a whole. An argument then exists for further research, which draws its sample from a number of industries and sectors, and which is focused on the horizontal SME to SME linkage, as opposed to the vertical subcontractor ties which have to date made up the bulk of empirical research.

By way of summary, Figure 2.9 below tabulates relative advantages and disadvantages for the four network types as classified in section 2.1.

Figure 2.9 - Network Classification Matrix

	Formal High Intensity	Formal Low Intensity	Informal High Intensity	Informal Low Intensity
Advantages	• Growth • Access to external resources • Market access (product / geographic) • Regional development	• Growth • Access to external resources • Market access (product / geographic) • Regional development	• Reduced transaction costs • Short cut bureaucracy • Growth • Access to external resources • Reduced market uncertainty • Regional development • Market access (product / geographic)	• Reduced transaction costs • Short cut bureaucracy •Safety Net (reduced risk) • Information source (environmental scanning) • Fulfills needs for social interaction with peers
Disadvantages	• Sucker / Punishment Payoffs • Opportunity Costs • Power inequalities • Weaken competitive position	• Opportunity Costs • Power inequalities	• Sucker / Punishment Payoffs • Opportunity Costs • Power inequalities • Weaken competitive position	• Opportunity Costs

Theoretical Difficulties

In addition to the practical difficulties outlined above there are a number of theoretical difficulties, which represent a considerable barrier to the generation of significant results. This statement is supported by Birley, Cromie and Myers (1991: 57) who find networks:

"difficult to analyse because each set of interconnections is unique to the focal person who creates it, because members of networks do not usually disclose their contacts and because they rarely discuss the nature of their association with others."

Johannisson (1986) identifies intangible linkages as being present where secrecy adds to the value of the tie; where national statutes make co-operation an illegitimate activity, or where the relationship owes its origins to means other than those of rational selection e.g. friendship or coincidence. Even analysis of a single actor's ties presents problems as actors frequently belong to more than one network, the boundaries of which are rarely clearly defined. These 'fuzzy' boundaries (Herbst, 1976) compound analytical difficulties still further. Network analysis is then a highly subjective art form, in which it is possible for two commentators analysing the same network to produce widely varying results, depending on where and how they draw the boundaries. Boundaries may be drawn on the basis of a number of criteria including the total network of a single actor, the direct network of a single actor, n-number of direct contacts, etc. Network studies are therefore rarely strictly comparable, as the complete absence of methodological standardisation makes it dangerous to generalise findings. With this caveat in mind the researcher should be wary of placing great importance on existing research which is for the most part little more than a counting exercise, and which fails to identify the cause(s) behind network participation. Findings made in these studies are therefore dangerous instruments when used for predicting behaviour outside their own sample.

2.6 Empirical Evidence

Empirical evidence relating to small business as a whole is comparatively scarce, but the absence is particularly marked in the field of networking, in which research has for the most part been conducted at the theoretical level. The brevity of this section is thus a reflection of the relative absence of such evidence, rather than a failure to identify such evidence where it exists.

One area which has received attention is the high technology sector, where potential for high growth, turnover, employment and risk have made it an obvious candidate for network analysis.

Tables 2.3 and 2.4 below are a summary of four such studies within the high-technology sector, the major point to be noted is that co-operative arrangements are by no means without precedent, with most firms studied being involved in at least one network, frequently more. Many of these linkages could be characterised as high intensity as defined in the classification offered in section 2.1. An example of this can be found in Bieman's (1992) study, where 12% of all firms sampled co-operated in the production of strategic components.

The reader should be mindful of the fact that the high technology sector is not representative of SMEs as a whole, the samples used in all cases are small and therefore of questionable significance. In addition to this they are European networks, and may therefore display cultural variations (especially in terms of OM attitudes and co-operative propensity) which may make them poor indicators of British network behaviour. Linkages within the networks surveyed were for the most part transaction or subcontractor relationships, between biotechnology SMEs and multinational corporations, and as such have limited explanatory powers for SME to SME network behaviour. Methodological variations between samples also limits result comparability. Results usage is thus limited to the indicative level and support of the theoretical literature. Empirical research is then still for the most part virgin territory in which a myriad of research opportunities still exist.

Table 2.3 - Past Empirical Co-operation Research

Survey	Biemans (1992)	Wissema & Euser (1991)
Field	Dutch Medical Equipment Industry. Sample of 17 medium sized enterprises. Case study research.	12 Dutch new technology networks.
Problems Facing Firms	(i) inadequate knowledge of market conditions (ii) Managerial incompetence	(i) Need for technological innovation.
Network Nature	New product development	No single motive for co-operation identified
Network Advantages	(i) Reduces cost (ii) Cope with increased market globalisation (iii) Able to standardise products (iv) Skills/Resources available for more complex products (v) Reduce risk	(i) Reduces cost (iii) Reduce risk (iii) Able to standardise products (iv) Access to market knowledge (v) Access to markets (vi) Skills complementarity
Problems of Setting up & Maintaining Networks	(i) Difficulties in allocating resources - time, money (ii) Integration of individual R&D departments (iii) Launch delays (iv) Quality of predeveloped inputs	(i) Difficulties in allocating resources - time, money (ii) Parties interest in the innovation should be roughly equal (iii) All parties must have a common interest (iv) No collaboration in areas which affect company's competitive edge
Limitations of Networks		(i) Unsuccessful where there is no opportunity for a clear win-win situation.
Relevant Findings	Potential users involved (% of total cases) in: Prototype development 41% Launch 46% 3rd Party involvement (% of total cases) in: Manufacturing of strategic components 12% Product development 53%	

Table 2.4 - Past Empirical Co-operation Research

Survey	Nueno & Oosterveld (1988)	Barley, Freeman & Hybels (1992)
Field	European technological alliances. Sample of 15 alliances, analysed using in-depth interviews.	Strategic Alliances in biotechnology industry Evidence is drawn from a database of 1939 organisational units, in which 3441 dyadic ties were identified.
Problems Facing Firms	(i) Need for technological innovation.	(i) Rapidly changing knowledge frontiers (ii) Volatility of financial markets
Network Nature	New product development Funded by subsidies from EU EUREKA project	Generally SME to large company relationships. (i) Contract out clinical trials (ii) Marketing agreements with larger firms (iii) Access to markets & distribution channels (iv) Only available means of financing R&D
Network Advantages	(i) Reduces cost (ii) Access to market knowledge (iii) Achieve critical mass (necessary resources). (iv) Creates greater internal commitment to R&D (v) Necessary for survival	(i) Access to market knowledge (ii) Overcome barriers to entry
Problems of Setting up & Maintaining Networks	(i) Network management is a complex task (ii) Potential for firms to be driven by others into R&D irrelevant to their own firm. (iii) Networks rarely equipped with the skills required for the commercialisation of the technology they develop.	None identified.
Limitations of Networks	(i) Potential for unplanned loss of knowledge (ii) Indirect control of company by others. Especially in SME to large firm relationships	(i) Loss of autonomy for SME actors.
Relevant Findings	No statistically meaningful conclusions could be drawn from the research.	(i) Development agreements, research agreements, and R&D agreements 27% of all ties. (ii) Equity ties (holdings) 23% (iii) Marketing agreement 16% (iv) Licensing agreement 14% (v) Joint ventures 6% (vi) Manufacturing agreements 4% (vii) Supply agreements 2% (viii) Grants 2%

In his extensive work on low growth high technology small firms (HTSFs) Oakey (1991) has identified the key role played by entrepreneurial attitudes and risk aversion, thus lending empirical support to the entrepreneurial debate discussed in detail later in this review. Founders of HTSFs in the biotechnology sector were found to be, with few exceptions, unwilling to use external capital to finance future development, develop research and development contacts or enter into joint ventures with other firms (Oakey, 1993; Oakey & Cooper, 1991: Oakey *et al*, 1990). The biotechnology sector in this regard reflects traits of low growth orientation and stubborn individualism which are to be found within the small business population as a whole (Gray, 1992).

Work by Birley, Cromie and Myers (1991) has been useful in demonstrating the existence of cultural variations in networking density, diversity and activity. A modified version of Aldrich *et al's* (1986) questionnaire was used to sample 1150 owner managers based in Northern Ireland. 274 useable questionnaires were returned (23.8%) from which results were derived and compared with similar studies in the USA (Aldrich *et al*, 1989), Italy (Aldrich *et al*, 1989) and Sweden (Johannisson & Johnson, 1988).

Although the results for the three countries (Northern Ireland, USA and Italy) are not strictly comparable, as a result of variations in questionnaire content and analysis, sufficient similarity exists between the studies to suggest that network behaviour is culturally dependent.

Conclusions drawn from Table 2.5 are tentatively made, as the American and Italian studies do not differentiate between customer and non-customer contacts. On comparing the American and Italian studies, it becomes evident that Italian OM spend over twice as much time developing or maintaining contacts, than their American counterparts. Both the

studies, by Aldrich *et al* (1989) and Birley, Cromie and Myers (1991) are however flawed, in that they fail to break the contact categories down sufficiently. Although an attempt is made by Birley, Cromie and Myers (1991) to break these down into customer and non-customer contacts' its use is confined to the identification of transaction and non-transaction contacts, with no indication being given as to the number of resource contacts (our principle subject of interest within this review) fostered or developed. Future networking research should seek to identify contacts on the basis of relationship characteristics, rather than aggregating them into the binomial classification; customers and others.

Table 2.5 - Mean and (Standard Deviation) Time Devoted to the Development and Maintenance of Personal Contact Networks

	Northern Ireland	Northern Ireland	USA	Italy
	Customers	Others		
New Contacts	8.3	4.7(3.52)	5.6(8.4)	11.5(9.4)
Existing Contacts	10.4	6.0(4.9)	5.8(8.5)	12.0(10.7)

Source: Birley, Cromie, Myers (1991: 66)

Table 2.6 seeks to identify the relationship between the focal actor and the five members of their personal network. The results indicate a situation in which network diversity is limited with family and friends representing the majority of first contacts (26% on average). This finding is disturbing in that family and friends have been found to display similar abilities and values (Granovetter, 1973). Their knowledge, advice and resources are thus of limited use, as those they supply are likely to be nothing more than a variation on those of the OM. Birley, Cromie and Myers's (1991) data is again guilty of excessive aggregation. It is not possible from these results to assess whether network diversity is a

function of company size. It seems reasonable to suggest that micro-businesses employing one or two individuals will have less diverse denser networks than the medium sized business where day to day activity results in a wider less frequently contacted membership. The data summarised in Table 2.5 relates only to Northern Ireland. As has already been stated, Northern Ireland may display a number of cultural factors including political uncertainty, which may result in OMs in the province networking more frequently with 'known' contacts (such as family and friends), than their counterparts in other countries would do.

Table 2.6 - Relationship Between the Owner-Manager and Personal Contact Network (Percentages)

Relationship	Contact					Total
	1	2	3	4	5	
Business	49	59	52	57	55	54
Family	20	9	14	12	11	13
Friend	31	32	34	31	34	33

Source: Birley, Cromie, Myers (1991: 70)

Table 2.7 indicates the level of occupational diversity within the focal actors personal network. The majority of network members were individuals employed in businesses outside of the OMs, with only a very small number of contacts being OMs or academics. The former is particularly alarming, as one would expect most successful SME to SME networks to be conducted at the OM level. This begs the question are OMs psychologically opposed to co-operation with their peers? A point which will be addressed at length in the next chapter. Caution should again be exercised when utilising the data in Table 2.6, as once more data is agglomerated to a level which makes it impossible to

determine causation.

Table 2.7 - Occupation of Personal Contact Network (Percentages)

Occupation	Contact					Total
	1	2	3	4	5	
Owner-manager	3	3	3	4	6	4
Employed (1)	62	64	71	71	71	67
Unemployed (2)	2	3	2	1	3	2
Academic	3	1	2	2	1	2
Professional (3)	28	28	19	20	18	23
SF Agency	0	1	2	1	1	1

(1) in business; (2) or retired; (3) professions which advise or assist small firms - bankers, accountants, lawyers.

Source: Birley, Cromie, Myers (1991: 70)

The results displayed in Table 2.8 find that the majority of contacts were originated in a business environment. It is interesting to note that S. F. Agency introductions are virtually non-existent, which supports earlier findings by Birley (1985) in her study of St. Joseph County (USA). The population despite their relatively small number (220,000) and the existence of strong community ties hardly used formal network sources, of which the support services were a part. This *prima facie* evidence would indicate a need for a proactive approach on the part of the network broker, as existing reactive S. F. Agency practice would appear to be ineffective / inappropriate.

Table 2.8 - Connection in which Owner-Manager first met Contact (Percentages)

Connection	Contact					Total
	1	2	3	4	5	
Business	63	66	61	69	71	66
Education	10	8	8	8	3	8
Family	8	8	7	9	10	8
Social / Friend	19	18	21	14	20	18
SF Agency	0	1	1	0	0	0

Source: Birley, Cromie, Myers (1991: 71)

The importance of community broker networks was discussed at length in Cromie, Birley and Callaghan (1993). 65 managers of small business support agencies were tested. Once more a modified version of Aldrich *et al's* (1986) questionnaire was used and the results compared against Birley, Cromie, Myers (1991) original sample of owner managers. Community brokers were found to have denser networks with only 22% of actors being strangers to one another, compared to 49% in the original study of OMs. From this they conclude that where they are characterised by a fair degree of heterogeneity, denser networks will have a quicker information flow, and larger extended networks than those found in the OM sample. The study would also suggest that brokers were more active networkers. Although the figures are not strictly comparable, due to the differentiation between customers and non-customers in the original study, it would appear that brokers spend more time both developing (84% spend less than ten hours on this activity compared with 94% OMs non-customer contacts) and maintaining contacts, approximately 25% spending over ten hours a week compared with 13% for OMs non-customer contacts. If one looks to the relationship between the parties involved in community broker networks, friends (27%) and family (2%) are again highly significant points of reference. The role of peers is also evident, with 12% of all relationships being drawn from this group. Cromie, Birley and Callaghan (1993) stress the importance of peer contacts which they suggest act

to significantly increase the individuals access to valuable client resources. In their conclusion they argue that:

"In essence the effective performance of the role of community broker requires the latter to be an even better networker than a business proprietor and in this study we hypothesized that the former would have larger direct and indirect networks, expend more energy on networking activity, be more proactive, be more willing to share contacts with others, have more dense and more diverse networks than autonomous entrepreneurs. Apart from our suggestion that community brokers would be more proactive networkers than autonomous entrepreneurs, our hypotheses were confirmed in all cases (..)" (Cromie, Birley and Callaghan, 1993: 262).

A two sector study of service networks by Bryson, Wood and Keeble (1993) is a notable contrast to this norm, in which the relative importance of low intensity informal ('soft') networks was revealed. 61% of consultancy firms and 76% of market research SMEs attributed the last three assignments to personal contacts made between the firm and its clients or word of mouth references. Resource relationships were also evident, 74% (85% of consultancy firms, 64% of research organisations) of the sample regularly used outsiders to enhance or supplement their activities. The three most frequently cited causes were the need to extend expertise, relieve work overloads, and reduce costs / increase flexibility. The percentage breakdowns for management consultancy and market research companies were 50%, 38%; 26%, 13%; and 15%, 4% respectively. This study highlights the potential benefits of networking, citing the establishment of a limited management consultancy comprised of a network of sole practitioners.

"While still predominantly operating as independent sole practitioners this company provides the 'resources' and formal company image to enable the individual professionals involved to undertake large projects. (...) This method of organization enables sole practitioners to compete, by open tender, with small and even large consultancy companies." Bryson, Wood and Keeble, (1993: 275).

Although its contribution to 'soft' network analysis in the service sector is noted, it bears

the same inherent flaw which is to be found in all other empirical studies identified herein, that is it fails to identify the factors which might cause some actors to participate in networks at the voluntary level whilst others do not.

To date networking research appears to have been confined to those networks that were classified in Chapter Two, as formal, and more specifically the high intensity variety such as those identified by: Barley, Freeman & Hybels (1992), Biemans (1992), Wissema & Euser (1991) and Nueno & Oosterveld (1988). Not only is concentration on this one aspect of co-operation myopic, it also fails to reflect existing agreements, which are in two-thirds of cases informal (Hakansson & Johanson, 1988). Informal networking is a neglected area, which may well confer no less significant benefits on its participants, and as such merits extensive research.

It is for this reason that entrepreneurial / OM behaviour is discussed at length in the next chapter. A number of approaches are advocated, from which the psychological method emerges as the most appropriate for application as part of a network research programme.

Chapter Three - Owner Manager Personality

3.1 Introduction

The literature base relating to personality psychology is littered with names familiar to psychologists and laypeople alike. No review of personality psychology could be considered comprehensive without some consideration of the work of Freud, Jung, Erikson, Allport and Cattell. All of these individuals have made a significant contribution to the personality literature and as a result will be considered in turn as part of this review.

This chapter does not, however, seek to present an extensive review of personality psychology, rather the intention is to present the reader with sufficient background information, to enable him/her to understand the minefield which personality psychology and more specifically entrepreneurial personality research represents. The chapter opens with a brief overview of the historical development of the field starting with Freud (Section 3.2), there then follows a brief introduction to trait personality psychology (Section 3.3), which leads into a consideration of the trait-situationalist debate (Section 3.4), the development of modern personality research instruments which have emerged from the lexical work of Allport and Odbert (1936) (Section 3.5), and finally a review of the use and development of personality research in the entrepreneurial / small business field (Section 3.6 and Section 3.7).

3.2 Personality psychology an historical overview

Although his work has been the subject of considerable criticism (Esterson, 1993) the starting point of any review must surely be the work of Sigmund Freud and his *tripartite* theory, in which personality is described as consisting of two conflicting components, the

id and the superego, and a controlling force - the ego. The id according to Freud performs two functions; survival and a drive for pleasure. The id is in a constant state of disequilibrium and as a result attempts to stabilise itself by realising its needs. One of the key needs for Freud was the exercising of the libido. The actualisation of these needs were, he argued, regulated by the controlling force of society and the individual's superego which develops from interaction with it. The superego is the factor which makes the individual feel guilty when he/she submits to the excesses of the id. The ego mediates between the id and the superego and makes an attempt at balancing the demands of both. Its aim according to Lloyd *et al* (1986: 700) is to;

"Maximize instinctual gratification while minimizing punishment and guilt."

Freud developed his theory further by providing a theoretical framework which outlined the methods an individual could use to protect him/herself from this internal conflict between id and superego. Through denial, projection, rationalisation, reaction formation, regression and sublimination it was argued that an individual could find a release acceptable to society, for the urges or needs he/she felt. Freud sought to analyse the relationship between the id and the superego in an individual's personality in one of two ways - free association or dream analysis, both of which Freud believed could be used to pinpoint unconscious desires that were not known to the conscious mind. A fuller account of Freud's work on the unconscious can be found in The Interpretation of Dreams (1900) and The Pyschopathology of Everyday Life (1901).

Although the validity of Freud's work has been questioned (Esterson, 1993), it represents the starting point for personality psychology, and it is on Freud's foundations that the work of others has been built. Jung (1934-55) postulated the existence of a so called collective

or universal unconscious in addition to the personal unconscious advanced by Freud. The collective unconscious, he argued, drew on archetypes which are shared by all human beings, such as living in a home and being reared by a mother and father (McMartin, 1995: 24). The collective unconscious then points to those aspects of personality that a group of individuals share and as a result is of little use in shedding further light on the development of trait theory which is of principal interest here. Jung's work on complexes, though, might be considered as the forerunner to the development of some of the traits on which one will concentrate later. Besides the inferiority complex with which almost all laymen are familiar with, Jung outlined guilt, ego and power complexes, all of which he argued manifested themselves through the expression of chronic negative emotions (McMartin, 1995: 25).

The work of Erikson (1965) is of interest here for a number of reasons. Firstly, he considers that an individual's ego develops throughout the course of his/her life, and that crises which a person faces have an influence on the way in which their ego develops. This is important here, as it acknowledges the fact that personality is dynamic, and as a result any study of an individual's personality is subject to change over time. Secondly, through his work on cross-cultural comparisons, based on observations of the Sioux Indians and Yirok people, he theorised the existence of cultural demands, which, he argues, also shape the development of an individual. Again, this point is important here, as it highlights the culturally specific nature of any personality - trait analysis, and conclusions emerging from it. Erikson's conclusions have been supported by subsequent work in trait theory, where American respondents have been shown to consistently display higher internal loci of control when compared with respondents from other countries (Avriam & Milgram, 1977; Hsieh *et al,* 1969; Reitz & Groff, 1974; Rawdon *et al,* 1995; Scheider & Parsons, 1970). The significance of culture has been espoused even more strongly by Perussia (1995) in his

study of Italian adults and psychology students. Using three items from Rotter's (1966; 1975) standard twenty three she found that inter-item correlation was poor, forcing her to conclude that the *"construct is culturally biased."* (*Ibid*: 1144).

Having acknowledged the fact that personality can be shaped and conditioned by culture, and that it is capable of change, if only minor over time, attention is now turned to the issue of trait psychology and its role within this research programme.

3.3 Trait Theory - An Introduction

The trait approach to personality (which is the approach taken in the empirical work summarised in this document) makes use of personality scales. Each scale is designed to measure a specific trait, and through its use it is possible to assign relative scores to a given sample group. The trait approach to personality rarely lays claim to measuring all an individual's personality, but instead concentrates on a specific number of dimensions or traits to the exclusion of all others.

Atkinson *et al* (1996) in reviewing the trait literature, claim that personality theorists seek to advance their field in one of three ways: (i) through the production of a set of traits which is both manageable and sufficiently diverse to encompass an individual's personality; (ii) by ensuring that instruments used by psychologists to measure personality are both reliable and valid; (iii) by conducting empirical studies to establish the existence or non-existence of relationships between traits and other traits, and between traits and an individual's behaviour.

One of the most notable advocates of trait theory is Eysenck (1995: 40), and it is his definition of a trait that is adopted here:

"Traits are relatively enduring descriptive characteristics of a person"

Eysenck was one of the first users of personality questionnaires and factor analysis. He used the results to develop a theory of personality which could be reduced to two dimensions: introversion-extroversion which he adapted and developed from the work of Jung, and neuroticism-stability. A third dimension psychotisim was added later. Individuals were classified on the basis of these two dimensions into one of four groups, each of which possessed a number of unique traits, as described using the ancient Greek labels *Melancholic* (Introverted-Unstable); *Choleric* (Extroverted-Unstable); *Sanguine* (Extroverted - Stable), or *Phlegmatic* (Introverted - Stable). According to Eysenck and Rachman (1965) a *Melancholic* is described as: Moody; Anxious; Rigid; Sober; Pessimistic; Reserved; Unsociable and Quiet, whereas the *Sanguine* person can be said to possess the following traits: Sociable; Outgoing; Talkative; Responsive; Easygoing; Lively; Carefree and Leadership. Allport (1961) represents the Greek humours pictorially in his physiognomic representations of the four states.

Eysenck has also argued that an individual's traits and their physiology are interrelated. In his ascending reticular activating system (Eysenck, 1967) he argues that an individual's position on the two dimensions of introversion-extroversion and neuroticism-stability can be used to predict the extent to which that individual is aroused or stressed by changes in their environment. Introverts, he suggests, are more readily aroused by their environment and as a result will suffer more greatly from stress.

Some support for Eysenck, at least for the introversion-extroversion stress argument is provided by Harkins and Green (1975) who find that introverts, due to their high arousal level, are better at tasks which require vigilance.

3.4 The Person-situation controversy

One of the biggest areas of contention within personality research is what has become known as the person-situation controversy (Pervin, 1996). The case for the situationalists is summarised well by Lloyd *et al* (1986: 705):

> *"the claimed consistency in a individual's personality is illusory. Far from behaving as trait theory would predict, individuals may be dependable in some situations and irresponsible in others, aggressive in some circumstances and passive in others."*

The above quote is essentially a summary of the work of Mischel (1968) who worked from the findings of Hartshorne and May's (1928) honesty experiments, where they concluded that a child's honesty was a function of the situation he/she found themselves in rather than a static position as defined within trait theory. Mischel (1968) extended the argument to encompass all traits, arguing that situation was the key to behaviour prediction, and as a result the effect of so called personality traits was limited. Bowers (1973) argued that to view behaviour as being a function of either traits or situation is overly simplistic, and a more realistic approach would be to view both the situation and the individual's personality traits as determinants of actor behaviour.

The person-situation debate contrary to popular perception predates the work of Mischel (1968: 2), and was so heated in the later half of the 1960s that Allport (1966) was able to

state that:

"Studies too numerous to list have ascribed chief variance in behavior to situational factors, leaving only a mild residue to be accounted for in terms of idiosyncratic attitudes and traits."

The existence or non-existence of trait reliability almost certainly represents the major debate within contemporary personality psychology. It was the recognition of this fact that led Loevinger and Knoll (1983: 196) to conclude:

"If there is no consistency in behavior, then the field of personality should disappear."

The reader should note however that these arguments have tended to centre around the test-retest accuracy of a trait over a period of decades, not months. Such debate does not therefore in anyway invalidate, the use of trait-based tests as a means of drawing conclusions about an individual's personality over shorter periods. Recent work in this area has however proved encouraging for those who argue that traits remain largely stable over time. McCrae and Costa in their 1990 review of the literature conclude by stating that personality is comparatively stable. Support is given to their argument by Watson and McKee Walker (1996), and Conley (1984a; 1984b) which they review. Conley provides evidence of stability for both extroversion and neuroticism traits over a forty-five year period. When data was analysed over a comparable fifty year period and once the data had been corrected for unreliability, trait stability over an individual's life was estimated at 0.60 or sixty percent (Costa & McCrae, 1992; 1994). Similar stability levels for studies over shorter time periods are reviewed and discussed in West and Graziano (1989). In reviewing the ten year longitudinal study of Block (1977) and the six year longitudinal study of Costa and McCrae (1988) they report stability levels of 0.70 and 0.82 respectively. Their review leads them to conclude that:

"Taken together, these studies suggest considerable stability over substantial periods of time when broad personality traits are rated by the individual or a knowledgeable informant." (West & Graziano, 1989: 177)

The debates and crisis of confidence in personality psychology (Sechrest, 1976) which followed the publication of Mischel's (1968) work appear now to have been resolved, and theorists appear to be largely in agreement on a compromise in which an individual's personality is viewed as resulting from the interaction between *"individual qualities and situational influences"* (Krahé, 1992: 69).

This approach which recognises the influence of both individual and situational elements has become known as modern interactionism. Although advocates of interactionism existed as early as the 1920s (Kantor, 1924; 1926) and 1930s (Lewin, 1936), it was not until the publication of Mischel's situationalism paper in 1968 that interactionism was given the attention it deserved. For a full discussion on the development of modern interactionism the reader is referred to Endler and Magnusson (1976) or Magnusson and Allen (1983). Clearly the emergence of modern interactionism as the dominant perspective in personality psychology demands a redefinition of what personality actually is. However, as with the networking literature researchers have for the most part avoided this task, but the following definition through the absence of widespread criticism could be said to have achieved implicit acceptance:

"Personality is a person's coherent manner of interacting with himself or herself and with his or her environment." (Endler, 1983: 179)

It is this definition of personality that the reader should bear in mind when reviewing the rest of this chapter and those that follow.

The major debates within personality psychology have been crudely summarised here so that the reader may become familiar with some of the key issues within this field. This will enable the specific discussions on personality trait tests and more especially those on entrepreneurial personality traits to be put into a clearer context. The reader should be aware of the fact that the literature body on personality and trait psychology is vast, and that the above is only intended as a brief introduction to it. In light of the person-situation debates it is all to easy to entertain negative attitudes towards the trait field, but one should bear in mind the words of McClelland:

> *"What we are interested in is not consistency per se but in lawfulness, in understanding and predicting behaviour."* (McClelland, 1981: 101 cited in Krahé, 1992: 35).

McClelland's quote is particularly pertinent for the empirical research that follows. As the respondent's personality is not being measured over time, but is instead taken as an indicator of the individual's behaviour and its effect on his/her co-operative propensity, the issue of consistency is largely redundant, and as McClelland stresses becomes one of lawfulness and reliability rather than consistency *per se*.

A case has been made defending the use of the trait psychology approach as a research method. Although it is recognised that traits are subject to change over the course of an individual's life, evidence is presented which suggests a high level of consistency over shorter time periods. Furthermore a review of the literature would appear to suggest that most individuals will have undergone the major changes they are likely to experience in their personality before they reach the age of thirty (McCrae & Costa, 1990). The empirical research relating to entrepreneurial personality which is reported later on in this document is based for the most part on responses given by owner-managers who are thirty

years of age or more. It is therefore likely that trait consistency amongst respondents will be high, and the results obtained should therefore be viewed as capable of producing a reliable indicator for both current and recently past behaviour.

3.5 Personality Traits and Research Instruments

Modern personality research instruments are frequently thought to owe their existence to the lexical work of Allport and Odbert (1936). John, Angleitner & Ostendorf (1988) however, trace the development of a lexical approach back even further to the work of Galton (1884), who identified approximately one thousand words that might be used to describe an individual's personality. The reasoning behind such studies has been articulated by a number of commentators, most recently Goldberg (1982) who argues that:

> *"Those individual differences that are most salient and socially relevant in people's lives will eventually become encoded into their language; the more important such a difference, the more likely is it to become expressed as a single word."* (Goldberg, 1982 as cited by John, Angleitner & Ostendorf, 1988: 174).

Allport and Odbert's (1936) study of the Websters New International Dictionary (1925) produced a final list of approximately 18,000 words, 4,504 of which were described as *"neutral terms designating possible personal traits"* (Allport and Odbert, 1936: 38). It was this list of 4,504 words supplemented by approximately one hundred temporary state terms that he felt were necessary, (Cattell, 1943) which Cattell took as the starting point for his own work. The original list was reduced through a process of clustering (171 clusters were identified), literature review and factor analysis to a total of 12 factors, which were used as the basis for his Sixteen Factors Questionnaire (16PF) for which he is globally renowned. Cattel's work is not however without its critics, who question both the methodology he employed and the results he produced. Replication of his results have also

proved difficult, so difficult in fact that John, Angleitner & Ostendorf (1988: 183) were able to state that they:

"know of no independent study of trait ratings that have replicated Cattel's 12 (or more) factors."

More congruence within personality research has however been evident since the work of Cattel, with five broad dimensions of personality, frequently referred to as the Big Five being identified in study after study. The work of Norman (1967) is felt to have been pivotal in the development of the five factor model. Using a copy of the Webster's Third New International Dictionary as his starting point he produced an initial word list of some 18,125, of which a mere 171 were not included in the list produced by Allport and Odbert (1936). Although the improvement at this stage might be considered as negligible, it is the improved selection criteria used to produce the final list which makes it superior. Clear rules were established which guided acceptance or rejection choices, with a word only being included or excluded where all four judges were in agreement.

The number of studies conducted within the personality trait field on an annual basis is staggering. Butcher and Rouse (1996: 88) in their review of the literature covering what are *"considered to be standard instruments, as well as some of the newer tests":* Basic Personality Inventory (BPI); Differential Personality inventory(DP1); Million Clinical Multitaxial Inventory (MCMI and versions two and three - MCMI-II and MCMI-III); Minnesota Multiphasic Personality Inventory (MMPI and MMPI-2 and MMPI-A); NEO (NEO Personality Inventory, and NEO-FFI and NEO-PI-R); Personality Assessment Inventory (PAI), Rorschach Inkblot Method (Rors) and the Thematic Apperception Test (TAT)), found that for the twenty year period covered (1974-1994) a total of 8,905 studies had been conducted on these instruments alone. Table 3.1 is adapted from Butcher and

Rouse (1996), and reports the data in terms of the average number of publications (for each test) per year for the period 1974-1996, the year in which the study was first reported and the effective popularity ranking of the test within the clinical field.

Table 3.1 - Clinical assessment instrument usage for the period 1974-1994

Test	Average No. of Publications per Year (Since first publication)	Year in which instrument usage first reported	Popularity Ranking
BPI	3.44	1986	8
DPI	0.17	1989	10
MCMI	25.60	1980	6
MMPI	206.62	1974	1
MMPI-2	33.83	1989	5
NEO	10.5	1983	7
PAI	2.33	1992	9
16PF	40.33	1974	4
RORS	93.76	1974	2
TAT	47.52	1974	3

Adapted from Butcher & Rouse (1996: 89)

Although personality trait studies have concentrated in recent years around what has become the 'Big Five', the labels used to describe these traits often differ (Barrick & Mount, 1991). It was this observation that led Digman (1989: 211) to conclude:

"there now exists an 'adequate taxonomy' (Norman, 1963). This taxonomy consists of five broad dimensions derived from varied factor-analytical studies over the past 40 years. These five are Extroversion / Introversion, Friendly Compliance / Hostile Non-compliance (Agreeableness), Will to achieve (Conscientiousness), Neuroticism / Emotional Stability (Anxiety), and Intellect."

Digman continues by stating that these traits have proved themselves to be '*extraordinarily robust*', observable across a number of age groups, using a number of methodologies, and in a number of different cultures, with a high correlation being recorded between participant ratings and actual behaviour (Digman, 1989: 211).

Table 3.2 below is taken from Digman's (1989: 199) analysis of the personality trait literature, where he demonstrates the recent convergence evident within the field. Emphasis has been added to highlight Digman's own dimensions / personality labels.

Table 3.2 - Five Personality Dimensions: 1949 - 1989

Authors	1	2	3	4	5
Fiske (1949)	Social Adaptability	Conformity	Conscientiousness	Emotional Control	Inquiring Intellect
Eysenck (1970)	Extroversion	Psychoticism	Psychoticism	Neuroticism	(Intelligence)[d]
Tupes & Christal (1961)	Extroversion	Agreeableness	Conscientiousness	Emotional Stability	Culture
Norman & Goldberg (1966)	Surgency	Agreeableness	Conscientiousness	Emotional Stability	Culture
Gough (1964)	Poise & Ascendancy	Socialization	Achievement		Intellectual Interests
Costa & McCrae (1985)	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openess
Hogan (1983)	Sociability	Likeability	Prudence	Adjustment	Intellectance
Cattel[b] (1975)	Group dependant Warmhearted Zestful Adventurous	Tenderminded Obedient Shy	Conscientiousness Controlled Sober	Excitable Tense Affected by feelings	Intelligence
Guilford[c] (1975)	Sociability Ascendance Activity	Personal Relations	Objectivity	Objectivity	
Buss & Plomin (1984)	Sociability		Impulsivity	Emotionality	
Digman	**Extroversion**	**Friendly Compliance**	**Will to Achieve**	**Emotional Stability**	**Intellect**
Lorr	Interpersonal Involvement	Level of Socialization	Self Control	Emotional Stability	Independent
Comrey (1970)	Extroversion	Trust Social Conformity Empathy	Orderliness	Emotional Stability	

a. Not in Fiske's original analysis but present in a reanalysis by Digman and Takemoto-Chock (1981).
b. Grouping of the 14 High School Personality Questionnaire (HSPQ) scales according to an analysis by Digman (1979).
c. Grouping of the 10 Guilford-Zimmerman Temperment Survey (GZTS) scales according to an analysis by Guilford (1975).
d. Intelligence excluded from domain of "temperament" traits.
N.B. Lorr study reported in: Lorr & Nerviano (1985); Comrey reported in: Noller, Law & Comrey (1987).

Although the labels used to describe the "Big Five" frequently vary (as can be demonstrated simply by comparing those provided by Digman (1989) with those of McCrae and Costa (1989)) the dimensions they describe are comparatively uniform. The definitions provided by McCrae and Costa (1989: 24) can therefore be viewed as representative:

"Each of the five dimensions represents a broad domain comprising a variety of more discrete traits, or facets. ***Neuroticism*** *includes the predisposition to experience affects such as anxiety, anger and depression, and other cognitive and behavioral manifestations of emotional instability.* ***Extroversion*** *includes sociability, activity, dominance, and the tendency to experience positive emotions.* ***Openess to experience*** *is seen in imaginativeness, aesthetic sensitivity, depth of feeling, curiosity and need for variety.* ***Agreeableness*** *encompasses sympathy, trust, cooperation, and altruism.* ***Conscientiousness*** *includes organization, persistence, scrupulousness and need for achievement."*

A number of tests are available from both academic and commercial sources, all of which claim to measure the Big Five. Briggs (1992) evaluates a number of adjective (Goldberg,

1990) and phrase based instruments (Costa & McCrae, 1985; Hogan, 1986) which have been developed to test the Five Factor model, or which have been subjected to further analysis in the light of it's emergence. The advantages and disadvantages of both approaches are assessed before the author concludes that each has its uses, with the appropriate test depending on the context in which it is required. He concludes that there are however only two major measures in existence:

> *"which have been developed to assess the five-factor model deliberately: the NEO Personality Inventory (NEO-PI; Costa & McCrae, 1985) and the Hogan Personality Inventory (HPI; Hogan, 1986).*" (Briggs, 1992: 272).

Further analysis and discussion by Briggs would appear to advocate the use of the Five Factor Inventory (Costa & McCrae, 1989) (an abbreviated version of the NEO Personality Inventory) where a short test is required, and when the researcher wishes only to assess the Big Five. The Hogan Personality Inventory is recommended for use when the researcher requires a test which measures additional dimensions outside of the Big Five (Briggs, 1992: 287).

The fact that the Five Factor model measures only principal personality traits is demonstrated empirically by Carnet (1995) in his study of a sample of 131 real estate agents. Participant's performance, as measured by objective measures relating to number of houses sold and listings obtained, were explained in terms of key personality factors. Data was collected on the individuals' level of experience, social desirability, general mental ability, conscientiousness and extroversion. Conscientiousness and extroversion were the only two traits within the Big Five which were felt to be applicable, both were measured using Costa and McCrae's (1992b) NEO Five Factor Inventory. Carnet found that when the participants data was modelled using hierarchical regression, his own measure, the Proactive Personality Scale (Bateman & Carnet, 1993) accounted for an

additional eight percent of the variance in the data.

3.6 Entrepreneurial Personality Research

Whilst the general personality psychology field has now reached a state of congruence and general agreement, entrepreneurial personality research is still in a state of chaos and flux. The trait-situationalist debate can still be viewed as current, and commentators appear no closer than they were thirty years ago to identifying a list of traits on which they can uniformly agree. In addition, debate within the entrepreneurial arena cannot be viewed as being entirely intellectually driven, many of the researchers have a vested interest in producing results which support the situationalist position. If entrepreneurial flair and ability can be shown to be the by-product of contextual factors, then a case can be made for the use of training programmes as a means of stimulating entrepreneurship. In contrast, a finding to the contrary is likely to result in the lucrative training programme money train coming off the rails.

Few commentators active in entrepreneurial research have sought to voice the interactionalist opinions prevalent in mainstream personality psychology, that is that, an individual's personality is the product of inherited personality traits and situational conditioning. A notable exception to this statement is Bouchikhi (1993) who has attempted to outline a constructivist framework for understanding the entrepreneurial process. He argued that it is the interaction of the entrepreneur's personality and behaviour as constrained and facilitated by the environment and chance which determine outcomes. The importance of the outcome (success / failure) is stressed as a determinant of future prospects. Bouchikhi (1993) is however an exception to the rule, and it is in truth this exceptional nature rather than the quality or depth of his argument which makes him

worthy of comment here.

Entrepreneurs have been the subject of animated debate since Cantillon coined the phrase, and sought to differentiate such individuals from managers on the basis of their position on risk. Entrepreneur is derived from the French verb *entreprendre*, and literally translated means to undertake, attempt, contract for, adventure, or to try (Trevisan, *et al* 1994; Solomon & Winslow, 1988). Consensus on entrepreneurial research ends here with its origins. The complexities inherent in the field have been recognised frequently in the literature (Martin, 1994; Trevisan *et al,* 1994; King, 1985), a point which has been made eloquently by Carland, Hoy and Carland (1988):

> *"It is clear that the only accepted and established fact about entrepreneurship is the lack of a consensual definition."* (cited by Martin, 1994: 5)

The development of entrepreneurial personality research has certainly been confounded by the absence of any definitive, or even widely accepted definition of what makes a person an entrepreneur. Definitions vary widely between studies; for some the entrepreneur is the founder of the firm (Begley & Boyd, 1987), for others to be classified as an entrepreneur one must own at least five businesses with sales of over $100,000 (Sexton & Bowman, 1986), and in other cases the criteria are as absurd as having been selected to receive a business loan (Pandrey & Tewary, 1979). Others, for example Brockhaus (1980a) have gone so far as to draw entrepreneurial personality conclusions from research conducted using student samples.

Ginsburg and Buchholtz (1989) seek to address the definitional issue by offering a four cell classification of entrepreneurs based on the individual's decision autonomy and financial risk (high / low) and their creativity and innovation levels (high / low). Their classification

has yet to receive wide acceptance however, and as a result definitional and cross study comparison difficulties still persist.

Definitional difficulties are compounded by the apparent intellectual rift which exists between commentators writing in this area. Peterson (1981) identifies three schools of thought: psychological, cultural and economic. The three schools are essentially divided by their position on the central issue, whether entrepreneurs are born or made (the label under which the trait-situationalism debate is argued within this field). The psychologists (Brockhaus, 1980a; 1980b; 1981; McClelland, 1975; 1976 and McClelland & Winter, 1976) argue that entrepreneurial motivation and drive is in limited supply, but continue their argument by suggesting that through adequate training techniques long term entrepreneurial supply can be increased. Culturalists argue that the environment or prevalent social culture dictates supply and demand for entrepreneurial ability (Fukuyama, 1995). National variations are therefore justified on the basis of differences in cultural codes (Peterson, 1981: 69). Subscribers to the economic school suggest that the supply of individuals with an entrepreneurial outlook is infinite, with the only barrier to their emergence being the absence of adequate rewards (Deeks, 1976).

The psychological school has traditionally been the subject of heavy criticism. Such criticism is more often than not attributable to poor methodology adopted by researchers operating in this area, rather than a flaw in the approach itself. An example can be drawn from the work of Brockhaus (1980a) in which he concludes that:

"the data in this study indicates that the level of risk taking propensity does not distinguish new entrepreneurs either from managers or from the general population (...) Thus earlier studies concerned with the entrepreneurs' risk taking propensity may have correctly found the majority of entrepreneurs to have a tendency towards moderate levels of risk, but they may have failed to recognize that this same characteristic is also true of the population in general." (Brockhaus, 1980a: 518-9)

Although Brockhaus acknowledges the fact that new entrepreneurs may not reflect established entrepreneurs in terms of their risk-taking propensity, there are other weaknesses in his work. Firstly, the control groups used are made up of managers who have recently either moved to an organisation which is new to them, or been promoted within an organisation. As the dependent variable in this study is risk taking propensity, anecdotal evidence alone would suggest that all three groups will be moderating their risk in response to an environment which is new to them. Clearly, once they have 'found their feet' a higher risk taking level is more likely. Question must therefore be placed over the validity of these results. A better methodological approach would draw comparisons between established entrepreneurs and established managers. Results derived from sampling these groups would present the reader with a better idea of entrepreneurial and managerial risk taking as conducted on a day to day basis, rather than a snapshot view of individual's risk-taking propensity during highly specific periods in their career or business development. Secondly, Brockhaus bases his questionnaire and analysis on the work of Wallach and Kogan (1959; 1961) and Kogan & Wallach (1964), whose sample was comprised of undergraduate students. It is the results from this survey which Brockhaus takes as being representative of the general populace. It is unlikely that undergraduates drawn from the higher socio-economic groups, who are more likely to come from self-employment backgrounds, who have probably received a good education and who tend to be clustered towards the younger generations will be representative of the population as a whole. A detailed critique of the use of students as surrogates to entrepreneurs is offered by Robinson *et al* (1991).

Similar question marks could be placed over the methodology used in the paper he presented to the Academy of Management (Brockhaus, 1980b). Again, the findings are

appealing. Successful entrepreneurs were found to differ from their unsuccessful counterparts, in that they possessed:

> *"a more internal locus of control, were less satisfied with their previous jobs, were more fearful of dismissal from their previous jobs, were younger, and were married."* (Brockhaus, 1980b: 338)

Again, methodological flaws can be identified. Sample size is once again an issue, with only thirty one entrepreneurs included within the study. This already small group is reduced still further by dividing it into successful and unsuccessful entrepreneurs. Successful entrepreneurs are defined here as those individuals still in business after three years, the unsuccessful entrepreneurs consisted of those individuals whose business did not fit the preceding criteria (at best this definition is questionable). No indication is given as to the size of these two groups. The statistical significance of the results can not therefore be determined, any conclusions drawn from this study should therefore only be used with caution.

Brockhaus's work has been reviewed here at some length because of his position within the entrepreneurial personality research field. His work is well known and respected within the field, and it is his work and his techniques which are often used as a template for others to follow. The preceding argument should, however convince the reader however that his reputation is built on a poor foundation. Although Brockhaus's research is representative of a good proportion of entrepreneurial personality research, there are other studies which merit further consideration.

The work of Dunkelberg and Cooper (1982) is less open to criticism. From the results of a survey of 1805 OMs of small firms they were able to produce a three class typology. Type 1 OMs were growth oriented and not adverse to change. Type 2 OMs valued their

autonomy above all else. One would suggest that these individuals are therefore less likely to network willingly, as the interdependent nature of co-operation is likely to be perceived as a threat to their independence. Type 3 OMs were described as craft oriented, the work itself was for them the principal motivator, managerial responsibilities being very much a secondary consideration. Type 3 OMs once again are likely to be poor networking candidates, with their unwillingness or inability to manage their activities at the strategic level making them unlikely resource networkers. Both Type 2 and 3 OMs would appear to be managing their own business as an alternative to corporate employment, and are therefore likely to be satisfied with a relatively stable income and the freedom to work to their own deadlines without interference from others. Chell *et al* (1991) criticise the labels chosen to describe the typology. They argue that the term 'craftsman' is biased towards manufacturing (a valid point when one considers that the economies studied are dominated by service sector firms). They continue by suggesting that the classification has omitted a vital group the caretaker. This point is however essentially a semantic one, and as such should be dismissed, as the caretaking function is clearly implied within the existing Type 2 and 3 groups, extending the typology on this basis would therefore appear to confer no additional benefit.

Entrepreneurial personality is reviewed here and later empirically tested for reasons similar to those of Miller and Dröge (1986: 539) (and earlier work in the area, which includes Miller, et al 1982 and Kets de Vries & Miller, 1984), where they argued that:

"personality is likely to be an especially critical and perhaps overwhelmingly influential variable in small firms, in which the impact of the leader can be very direct and pervasive."

In their study of chief executive officers (CEO) in ninety three predominantly family owned businesses located in the Canadian province of Quebec, Miller and Dröge (1986)

found that both firm size and a CEO's personality were determinants of the firm's structure (as measured in terms of the degree to which it could be said to be centralised or formalised). Their most interesting finding, and the one about which they expressed greatest personal surprise was the fact that for smaller firms, the firms' size was *'sometimes a less significant predictor of structure than the CEO personality'* (Miller and Dröge, 1986: 553). The CEO or owner manager's personality is likely to have an even more pronounced affect in small or micro-firms (the mean firm size for Miller and Dröge's study (1986) was 298 employees) where his/her decision making is responsible for the day to day activity as well as the development of a long term strategy. This assumption represents one of the key hypotheses which will be tested later in this document.

Clearly further empirical research is required to determine for certain whether entrepreneurs are *born* or *made.* It would appear likely however that the findings and theoretical conclusions which have emerged from the broader personality psychology field hold many of the answers to this problem. Here, as there, the most obvious and surely the most convincing approach is an interactionalist one, in which entrepreneurial ability is likely to be a function of personality traits (inherited for the most part from parents) and environmental conditioning by family, friends, peers and organisational and national culture.

The entrepreneurial debate does not end here, however, because another group of scholars maintain that entrepreneurship is in fact not based in the individual at all, but is instead an organisational management approach (Covin & Slevin, 1986; 1988; 1989; Slevin & Covin, 1990; Stevenson *et al,* 1989). Authorities which subscribe to this approach have argued that analysis of the firm itself represents a superior method, with fewer of the difficulties which are found ingrained in the psychological approach. Although this statement may

perhaps be true of large corporations in which no single individual's personality can dominate strategic and operational decision making, the same cannot be said for smaller firms. At the SME, and in particular at the micro-business level, entrepreneurial attitudes and business culture are interdependent. As a result any decisions, even when made by employees, are likely to reflect the values of the owner manager. The organisational management approach is therefore rejected and deemed inappropriate as a means of conducting the empirical research reported here. Despite being useful as a means of identifying organisational culture, and the effects of that culture, it fails to give the user any indication of causation, and it is the factors responsible for co-operative behaviour which we are most anxious to identify here. Most SMEs fit into Miller's (1983) 'simple firm' category, in which power is centralised at the top of the organisation. The personality approach would therefore appear to be the most logical form of analysis for smaller firms, with the structural management approach being more appropriate for studies of Miller's planning and organic firms. In these organisations size and flexibility orientation result in a more diffused power and culture base, which is less concentrated at the top of the firm, or at least is not to be found in a single individual.

3.7 Entrepreneurial Personality Studies

As has already been stressed through a consideration of the work of Brockhaus, many tests are either poorly constructed or insufficiently validated (Caird, 1993).

Johnson (1990) in his review of twenty three studies which have sought to examine the possible relationship between entrepreneurship and need for achievement, finds that twenty of these support the existence of a positive relationship between need for achievement and

entrepreneurial behaviour. Johnson emphasises that the case for such a relationship is as of yet far from proven. He argues that due to the number of instruments that have been used to measure achievement motivation it is impossible to be certain that they are all measuring the same construct. Johnson's argument could easily be extended to encompass entrepreneurial personality research *per se*. This problem is likely to persist until the emergence of a consensual taxonomy such as the Big Five which is evident in mainstream psychology.

The original work on need for achievement was conducted by McClelland (1961) who through an analysis of thirty four countries for the twenty eight year period 1950 to 1977 was able to conclude that a relationship existed between a country's need for achievement and the level of economic growth it enjoys. Gilleard (1989) repeated McClelland's analysis but was unable to support his contention. Need for achievement personality instruments, however, despite this possible unreliability are still used heavily within the entrepreneurial research field.

Table 3.3 below is adapted from Perry's 1990 review of the entrepreneurial personality research literature. He provides evidence which would suggest that variations in personality traits exist not only between entrepreneurs and the general populace, but also within the entrepreneurial group itself. Table 3.3 is a summary of studies which have tested high growth entrepreneurs against other entrepreneurs who have not experienced such high growth, with a view to identifying differences in the personality traits they possess.

Table 3.3 - A Review of Psychological Research Studies comparing High-growth and normal growth entrepreneurs

Study	Need for Achievement	Need for Autonomy	Internal Locus of Control	Risk Taking Perception
Brodribb (1967)	+	+		
Carland (1982)	0			+?
Fargher (1971)	+			
Hewett (1987)				-
Niller (1983)			+	
Perry *et al* (1984)	+		0	
Perry *et al* (1986)	+		+	+
Perry *et al* (1988)	+		0	0
Smith & Miner (1984)	+			+?
Van de Ven *et al* (1984)	+	+		0
Woodworth *et al* (1969)	+	+		

+ = a distinguishing characteristic, correlating positively with growth
- = a distinguishing characteristic, correlating negatively with growth
0 = not a distinguishing characteristic
? = possible, but not statistically significant relationship

Source: Adapted from Perry (1990: 24)

Need for achievement was identified as a trait which could be used to differentiate high growth entrepreneurs from their lower growth counterparts. All but one of the nine studies which investigated need for achievement found that a high need for achievement was positively correlated with growth. Perry suggests that Carland's contrary result can probably be attributed more readily to the methodology employed, with comparison being based on owner-managers strategic styles rather than their actual performances (1990: 28). Need for autonomy has also been used as a means of identifying high growth entrepreneurs, the three studies reported in Table 3.3 suggest that there is a positive correlation between growth and need for autonomy.

A more detailed discussion is required to explain the seemingly contradictory results reported in studies investigating entrepreneurs locus of control and risk perception levels. Perry suggests that the contradictory results for locus of control reported in his own studies (Perry *et al,* 1984; 1988) can be attributed to his choice of research instrument; Levenson's Internal Locus of Control instrument was used in place of the more frequently utilised

Rotter instrument. Similar arguments are offered as a means of explaining contradictory findings for risk perception, leading Perry to conclude that:

> *"Imprecision caused by different instruments used to measure aspects of risk confirms the influence of instrument choice upon findings about entrepreneurs." (Ibid.:* 28)

He continued his argument by suggesting that "perhaps instruments specific to entrepreneur research should be developed"(*Ibid.:* 28). A psychological research instrument which has been designed for exclusive use on entrepreneurs now exists, the Durham Business School Personality Index (DBSPI), and it is this instrument which will be used as one of the principal tools in the empirical phase of this research programme.

3.8 Entrepreneurial Personality and Co-operative Behaviour

The psychological approach is adopted here then, as a superior method for investigating OMs' co-operative behaviour. Its superiority is particularly marked if an OMs network is viewed as an extension of themselves, as it is argued to be by Epstein (1969), who refers to co-operative linkages of this type as personal or ego networks. Past researchers have failed to address one of the major determinants of networking behaviour, the OM's personality. *Prima facie* evidence relating to actors' loci of control, need for autonomy and risk taking propensity in the entrepreneurial context would appear to suggest that the psychological profile of networking owner managers will be quite different from those OMs who are not proactive-voluntary networkers. One can therefore hypothesise that networking OMs will have both a reduced need for autonomy and a greater tendency towards internal loci of control than their counterparts who do not network voluntarily, or keep their networking activities to a minimum.

Despite a plethora of available psychological tests which address all aspects of an individual's need for achievement, locus of control, risk taking, problem solving and need for autonomy, the potential user is faced with a myriad of difficulties when trying to choose between them. Empirical data used to validate the measure are non-standardised, making cross sample comparisons questionable at best. In addition to this, sample characteristics frequently differ significantly in terms of respondent type, culture, and the statistical approach adopted.

Past studies have drawn their sample from populations as diverse as children (Cole, 1974; Gordon, 1977; Wolk & Eliot, 1974), adults (Dixon *et al*, 1976), managers (Miner, 1976; Morrison, 1977), employees (Dailey, 1978; Muldrow & Bayton, 1979), entrepreneurs (Brockhaus, 1981, 1980a, 190b; Caird, 1989a; Caird, 1989b; Ettinger, 1983; King, 1985), teachers (Miskel, 1974), administrators (Miskel, 1974) and university students (Spokane & Derby, 1979). Difficulties encountered as a result of variance in statistical approach can also be demonstrated. Simply by comparing the measures used in analysing reliability one finds that a number of instruments in use; for example Cronbach's alpha coefficient (Mischel, 1974; Keenan & McBain, 1979), Spearman rank correlation (Feji, 1975), the Spearman-Brown estimate of internal consistency (Morris & Synder, 1979), and the Kuder-Richardson (Dailey, 1978) estimate of internal reliability to name but a few.

Inconsistency is not the only criticism which can be levelled, however. Tests are also proposed which have not been checked for internal reliability (Duke & Nowicki, 1973) or reliability over time. Where test-retest reliability is assessed the interval between tests varies widely, from two weeks (Bachrach & Peterson, 1976) to a year or more (Fineman, 1975).

A number of differing question types have been used, including the forced choice (Anderson, 1977), sentence completion (Singh, 1979) and Likert scales (Steers & Spencer, 1977). Even within these subgroups application varies, with four point (Dixon *et al,* 1976), five point (Duffy, 1977), six point (Hill & Bale, 1980), seven point (Ivancevich, 1980) and nine point (Reynolds, 1976) Likert scales receiving use.

It is hardly surprising then that despite the existence of a number of psychological tests, only a small number are appropriate or relevant here. The choice is reduced even further if the test is required to measure a specific subgroup: entrepreneurs (King, 1985; Caird, 1989a; Caird, 1989b), children (Gordon, 1977), students (Spokane & Derby, 1979) and so forth. If the test is to be of the mailed self-administrated type, response rate becomes a major consideration. In such situations instruments with a high number of items become unadministerable, as the length of the questionnaire results in a reduced response rate and with it a reduced likelihood of producing meaningful and generalisable results (Powers & Alderman, 1982). Finally, and perhaps in many ways most importantly, the questionnaire needs to be perceived as relevant to its recipient, if this is not the case a low response rate will result. The chosen instrument needs therefore to reflect the interests of the sample, in this case their business. In addition, an instrument which considers the respondents' business activities is clearly superior here, where one is looking to establish a relationship between OM's personality and their co-operative propensity and behaviour. A test which fails to relate personality to business situations is likely to produce inconclusive or incorrect results. This is highlighted in the person-situation debate above, where it is stated that actors behaviour maybe a function of the situation in which they find themselves. Use of a test which measures the big five (e.g. NEO-FFI (Costa & McCrae, 1989) or the HPI (Hogan, 1986)) is therefore inappropriate on the grounds of both poor relevance and situation measurement, as well as insufficient diversity in terms of the dimensions it seeks

to measure. The actual test chosen will be discussed at length, along with the dimensions / traits it measures in the methodology chapter which follows this one.

3.9 Summary

This chapter has had a broad agenda, in which the origins and development of personality psychology have been outlined, trait psychology has been discussed, with emphasis being placed on the person-situation debate. This led to a consideration of recent developments in modern personality research instruments, and concluded with a discussion of the Big Five. Finally entrepreneurial research and more specifically entrepreneurial personality research was discussed. In this discussion the difficulties inherent in a field which operates with no definitive definition of the thing it seeks to measure (entrepreneurs / entrepreneurship) was stressed, as were the obstacles that prevent an effortless choice of personality research instrument. It becomes clear that entrepreneurial personality research is the inferior cousin of general personality psychology in terms of the quality of both theoretical and empirical research. The need for relevance in the eyes of the respondent OMs though necessitates a test which includes situational factors such as business context.

Chapter Four which follows, recognises the need to consider personality as an antecedent to owner-manager co-operative behaviour, and proposes a model for increasing public sector efficiency in their role as a network - co-operation facilitator. The public policy model advanced is then used and tested as part of the empirical phase of this research programme.

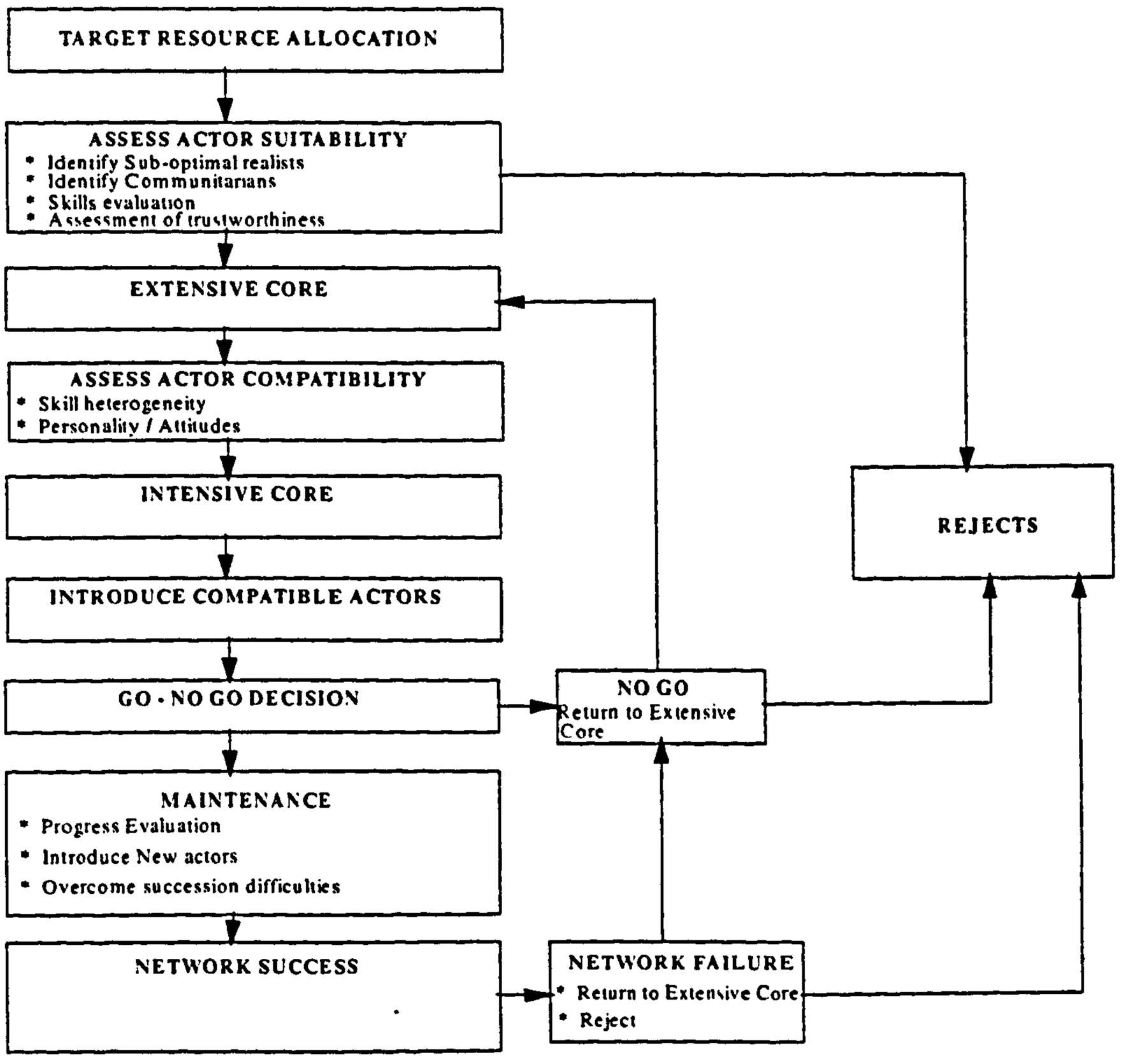
Chapter Four - Provisional Network Process Management Model

The following model is advocated for use by independent actors known as brokers, and by OMs facilitating their own networks. These individuals should be responsible for the assessment, initiation and management of prospective network. The model recognises the fact that in many cases the market is unlikely to produce such arrangements (at least at the high intensity level) naturally. In such instances the broker represents a neutral party ideally placed for the development of trust. Some industries and markets will lend themselves readily to the co-operative idyll, and in these instances it is clearly wrong to suggest that all networks need to be managed by a broker employed within the public sector. The facilitating OM will face a number of additional difficulties; greater difficulty in fostering trust, managing power differentials, identifying ulterior motives, and finding the additional time and resources which will be necessary if the network is to be initiated successfully. All of these difficulties will, of course, be magnified in line with increases in network intensity. Clearly, this argument does not extend to the conglomerate level where strategic alliances and other co-operative practices such as cartels are well documented. SME to SME linkages, it is argued, will not occur regularly without external intervention, as the OMs need for autonomy and inherent distrust of others prohibits such interaction. The broker must then identify individuals whose attitudes and skill bases make them suitable network candidates. The model extended below represents one possible approach.

It should be stressed at this point that this model is not without limitations, and is not intended as panacea for the ills of all SMEs. It can be argued that many firms and individuals are simply not suited to involvement in or the application of the networking concept. Where suitable candidates do exist, skill homogeneity may be evident, and thus the gains that can be derived from co-operation will become almost negligible. Firms that

can gain from networking are not easily identified, and the network facilitator is therefore instrumental in the success of any networking programme, and the ultimate sustainability and returns derived from any co-operative strategy is thus a function of the facilitator's competence. This is an issue which authorities should be mindful of when selecting brokers and allocating project resources.

Figure 4.1 - A Provisional Network Process Management Model



Facilitator emphasis is placed on the importance of partner selection and the heterogeneity of skills and resources within the network. If employed effectively a network represents an effective solution to the difficulties that SMEs face, providing its members with a tool for expansion and cost reduction. Where an environment of trust and commitment has been developed all parties are well positioned for reward. If trust has not been successfully

developed at least one party to the agreement is likely to incur losses as a result of defection by others. The network broker acts as a facilitating intermediary between actors. and as such is responsible for the identification of potential network members, assessment of their compatibility as a team, initiation and maintenance of viable networks. In the first instance the government, OM facilitator or broker needs to isolate the sector, which will benefit most from network formation. Resources may be designated on the basis of regional or sectoral need, potential for growth or skill agglomeration.

In assessing actor suitability it is important to note that inappropriate individuals or organisations advanced at this stage may well damage the integrity of the network and its ability to deliver the benefits for which it was established. Facilitators must therefore be stringent in their application of co-operative criteria and reject any actors that are inherently unsuitable, or do not meet network requirements.

By utilising the attitudinal dichotomy of autonomists and communitarians it is possible to identify those owner-managers best suited to co-operative activity such as networking. The autonomist is characterised by a need for control, a sense of distrust and a desire for applause (Kets de Vries, 1985). These individuals place great importance on their autonomy, seeking to maximise their decision making freedom by minimising the influence others have on their actions. For these reasons autonomist owner-managers should be rejected, as their inclusion is not conducive to the development of trust or network sustainability. In contrast the communitarian is aware of the synergic advantages that can be derived from co-operation with others within the macro-environment. Owner managers falling into this category do not possess the same need for control and are not so distrustful of those with whom they interact. Networking activity, be it actor or broker initiated, should therefore be confined to those firms whose OMDs display communitarian

characteristics.

Remaining actors are then screened further on the basis of skill and resource possession, by utilising the nine key skills for long term success and growth as advanced by White, *et al* (1994), and as outlined in detail in Chapter 2: Information accumulation; Personnel Management; Negotiating; Organisation and inventory management; Innovation; Risk management; Quality control; Market orientation, and Financial management.

Two groups are identified, individualists (who either possess or believe they possess the necessary skills for market interaction) and sub-optimal realists (those who perceive they lack one or more of the skills identified above). It is important to note that the dichotomy is between absolute possession and non-possession of skills whereas in reality, most individuals will at least have some intuitive feel for each skill area, and in fact it is probable that absolute maximum levels will be unobtainable. However binary classification can provide an adequate guide in terms of satisfactory and unsatisfactory levels of the skills under consideration.

It would therefore seem reasonable to assume that those actors who can be classified as individualists will have little or no interest in co-operation. Approaching OMs in these organisations, therefore, will in the vast majority of instances, succeed only in wasting valuable facilitator time. Facilitators and brokers should therefore focus their attention on owner-managers who can be classified as sub-optimal realists.

Networking owner-mangers need to be conscious of the limitations of their organisations. They also need to bring with them some skills, competencies or resources that are likely to be of use to other OMDs. Reductionism on this basis will prevent excessive homogeneity

within the extensive core, and unnecessary involvement of actors who have nothing of value to offer.

Finally, the remaining actors are assessed on the basis of historical data pertaining to their trustworthiness (the costs and dangers of default having been identified elsewhere) as demonstrated by credit rating, past business records, supplier/customer references, and other relevant criteria.

By evaluating owner-managers on the basis of these criteria, facilitators can reduce the number of owner-managers to an *extensive core* of potential networkers. By decreasing the number of firms targeted in this way, it is possible to optimise grant and support efforts, whilst simultaneously maximising gains for individual networks.

The *intensive core* is made up of those individuals whose personality or attitudes; skills and aspirations are compatible with one another. It is at this stage that the broker is required as 'matchmaker', they must attempt to correlate actors' intended forms of co-operation against those for which they are best suited, and match them with the individuals with whom they are most compatible. Viable networks should be designed so as to maximise skill heterogeneity, sustainability and individual actor gains.

At the next stage 'compatible' actors are introduced, and the feasibility of co-operation between them, determined. Firms and actors which are clearly incapable of co-operation with one another are returned to the extensive core, unless they are judged to be inappropriate members of any network (i.e. incorrectly assessed at previous stage) in which case they are rejected.

Following introduction there will be a period of compromise and negotiation in which actors and brokers must accommodate individual's requests or demands for power, autonomy, resource inputs and reward. A key role for the network broker is to provide advice on the formalisation of agreements. Emphasis should therefore be placed on contracts as a way of substantially reducing fears of defection by each party. Legal agreements, by providing a form of redress, can help to reduce fears, but it should be noted that they fail to negate all risk, and the role of trust is therefore still important for general day to day co-operation. The broker should draw attention to the holistic nature of the network and the ethos of membership. The finalised strategy should be representative of all participants, whilst at the same time maintaining network compatibility and utility. Having identified a potential network the broker needs to make a final assessment of its feasibility, and decide whether network co-operation is still a viable solution, and whether those actors involved represent the available optimum.

Feasible networks are then initiated. Start-up is potentially the most hazardous stage of development, as the realities of co-operation in terms of both advantages and disadvantages of interdependence become clear to all parties involved. Some networks are thus destined to fail at this stage, as actors realise that their expectations and perceptions of participation exceed the realities of membership. The broker should concern him/herself at the outset with the minimisation of actor defection and desertion, drawing on personal experience as well as theory to reassure network members. The facilitating OM is likely to encounter greater difficulty in developing an environment of trust, and may therefore reach a critical incident point at this stage, as participating actors faced with the realities of co-operation once again consider the dangers inherent in co-operation, and in particular the existence of ulterior motives or the possibility of facilitator defection. By citing the long term benefits of participation and encouraging the development of trust at earlier stages the

facilitator should be able to play down the obvious short term difficulties associated with transition to a network system.

Once initial difficulties have been overcome the role of the network broker is dramatically reduced, with their participation being reduced to that of observer, although they may also fulfil a quality control function (by identifying possible difficulties and presenting feasible solutions). In addition to this the broker may also be able to identify and introduce new actors to the network. Providing the broker has succeeded in developing an environment of trust, it should be possible to introduce new members into the network relatively easily, as existing members will hold sufficient belief in the brokers ability to identify individuals who will make a worthwhile contribution to the network as a whole. For the facilitating OM the network must be managed at the operational as well as the strategic level, network management is then a daily consideration for the facilitating OM. Brokered networks will also need management on a day to day basis, as a result of which a leader will need to be identified or elected for future operational and strategic decision making.

For whatever reasons, be they internal or macro-environmental, there will be networks that succeed, and which afford their members synergic advantage, and others which will fail. In the event of a failure both the actors and broker need to consider the viability of future networking arrangements. Where the costs of network membership have exceeded the benefits (network failure) the facilitator needs to make a realistic appraisal and decide whether the difficulties encountered were project specific or the result of an error made during the selection stages. If failure can be attributed to project related difficulties and actors are not adverse to future co-operation, they can be returned to the *extensive core*, for possible inclusion in future networks.

Actor selection techniques will clearly need to be evaluated over a period of time. If network failure is high the model will clearly need revision. However, in reality the success and sustainability of public sector managed networks will be a function of both actor suitability and broker ability, good broker recruitment is therefore a prerequisite.

The following characteristics are of fundamental importance, and represent essential evaluative tools in the recruitment and selection of potential network brokers. Primary emphasis should be given to examples of previous business success which will help the broker establish valuable credibility and OM respect. Preference should be given to those candidates with proven competence in general management, managing their own business or consultancy, as once again this will assist the development of credibility and respect.

Brokers must also demonstrate an ability to evaluate circumstances holistically. Candidates therefore need to demonstrate mental capacity and strength of character, which will be necessary if they are to retain their neutrality and defend the network as a whole, rather than being persuaded to support the sentiments of one party at the expense of all others. Broker neutrality is essential to the development of trust a key factor in network success, and for this reason public employment is advanced here as the only method for successful network brokerage. The development of an environment of trust and commitment will be almost impossible where the broker is seen as having ulterior motives for his involvement, most notably the pursuit of personal profit. For this reason public sector employment is seen as being a prerequisite to network success. Finally facilitators need to possess good interpersonal skills with which to communicate, arbitrate and conciliate. These skills will be particularly important where parties display highly divergent views, objectives and strategies.

Candidates with the aforementioned skills will not be attracted unless the remuneration offered is at least equal to that available in the private sector. Adequate local or national government support is therefore essential if the network model offered above is to succeed as a means of increasing SME competitiveness.

The model offered seeks to conceptualise future broker activity. It is only provisional, and is likely to change as flaws are identified through usage. As has already been stressed, its success relies heavily on the competence and more particularly the judgement of the facilitator. If networks are managed within the public sector broker recruitment is of paramount importance. If the wrong broker is recruited the network will fail, as the subjectivity of the classifications offered within the model leaves little room for errors of judgement.

4.1 Literature Review Summary

To summarise, the networking literature can be said to be characterised by definitional ambiguity, infrequent practical applicability of findings, a dearth of research at the empirical level and poor methodology where empirically based results are to be found. The literature review presented offers a working definition and a four cell matrix classification based on the dichotomies of formality and intensity. The definition and matrix offered not only go some way towards the clarifying the existing literature, but also offer an analytical framework for development and use during the empirical stage of the PhD programme. By assessing networking activity in terms of its Intensity and Formality the researcher acknowledges the possibility that significant differences may exist between networks. This is in stark contrast to existing research that has assumed that all networks are effectively

the same, with all co-operative agreements experiencing similar benefits and difficulties. By considering the networks in this way, it may be possible to identify varying practices (all of which will have different implications for actor participation and network brokerage) which may previously have been masked by aggregate evaluation. For example one can hypothesise that *autonomists* will network at the compulsory level only, with interaction limited to the essential / unavoidable contacts e.g. accountants, bankers, and lawyers. *Communitarians*, in contrast, will network voluntarily, courting a number of potential actors prior to the formation of any firm relationships. These individuals will in many cases, implicitly state their communitarian outlook through membership of local Chambers of Commerce, Trade Associations or Institutes. Any sample used should therefore recognise this potential bias. Firms should thus be selected at random so as to reflect the business population as a whole.

The network has been considered here as a more efficient alternative to the existing dominant systems of the market; where transaction costs are high and the hierarchy; in which bureaucracy impedes flexibility and quick organisational response to changes in the macro-environment. PDG theory was used to demonstrate the long term superiority of co-operation, as compared with the temptation reward, followed by default after default which is the situation which would be found in normal competitive business relations. Implicit in the construction of the PDG is the concept of trust. If actor trust is absent co-operative behaviour will be short-lived, and optimal member benefit will not be realised. Where trust and commitment is successfully fostered network members are well positioned for long term reward. A review was made of the literature relating to the advantages and disadvantages of network membership, which simultaneously highlighted the inadequacies of research relating to this at the empirical level. Empirical findings were dismissed for the most part, as little more than a counting exercise. Superior results based on longitudinal

studies of specific networks were also discussed, although it was recognised that these were all drawn from the high technology sector, which can not be considered as being representative of SMEs as a whole, either in terms of growth rates, investments levels (and associated risk), or profit potential. The most notable empirical oversight is the lack of consideration of co-operative precursors (antecedents). Although it is recognised that a number of these exist, including national culture, principal attention within the review was paid to the role of OM personality, which was advanced as the primary antecedent to network propensity and behaviour. A number of personality variables were identified, which include locus of control and need for autonomy, for empirical evaluation as part of a PhD programme. OMs with a high need for autonomy, for example, are expected to make unlikely networkers at the voluntary level. Further discussion and justifcation of this position is given in the section below

4.2 The Owner-Manager Personality Focus and Network Behaviour and Success - A Justification

The psychological approach adopted here is extended as a superior method for investigating OMs' co-operative behaviour. Its superiority is particularly marked if an OMs network is viewed as an extension of themselves, as it is argued to be by Epstein (1969), who refers to co-operative linkages of this type as personal or ego networks. Past researchers have failed to address one of the major determinants of networking behaviour, the OM's personality. *Prima facie* evidence relating to actors' loci of control, need for autonomy and risk taking propensity in the entrepreneurial context would appear to suggest that the psychological profile of networking owner managers will be quite different from those OMs who are not proactive-voluntary networkers. One can therefore hypothesise that networking OMs will have both a reduced need for autonomy and a greater tendency

towards internal loci of control than their counterparts who do not network voluntarily, or keep their networking activities to a minimum. Further justification for this position as drawn from the networking, personality psychology and general small business literature bases.

The work of Filion (1990: 3) has implied that there is indeed a link between owner manager's networking propensity and activity and their owner-manager's personality does indeed exist, he suggests that "*An ever-increasing amount of entrepreneurship research literature shows a link between entrepreneurial performance and networking. It shows that the more an entrepreneur enlarges a network, and the more use is made of external resources, the better success will be achieved.*" (Filion, 1990: 3).

He reinforces his position and criticises the existing literature with reference to his own primary research (Filion, 1990: 11), from which he feels able to conclude that the *"Research literature sometimes seems to suggest that networking alone will result in success. It is suggested here that networking be considered as part of a wider process. This process should include knowhow (Ronstadt and Peterson, 1988) and also a central element around which the entrepreneur's progression evolves. This element can be referred to as vision.*". It is a recognition of the importance of 'vision' which represents the core of the owner-manager personality - an antecedent to SME decision making model, extended below.

The focus on owner-manager's personality as a, if not the principal antecedent to networking / co-operative activity, is given further support by Shaw (1998b: 7), who in her review of the literature advocates actor centred network analyses, suggesting that "*There*

has been less of a concentration in networking studies on exploring the networks which individuals within organisations socially construct. (...) Nohria (1992) comments that a focus on the individual in organisational network studies has only recently attracted research interest as 'individuals are alerted to the importance of their so called "connections" in getting things done' ". Owner-managers as the key individuals in SMEs and most particularly micro-firms are an obviously important group who must be represented in such analyses. It is for this reason that researchers such as Aldrich and Zimmer (1986) and Birley, Cromie and Myers (1991) have chosen to sample them in their network structure - morphological analyses that they have undertaken. For similar reasons, owner-managers and their personalities are a natural starting point for the primary research reported here, which seeks to identify antecedents to owner-manager's networking / co-operative behaviour and the relative success it enjoys.

Further support for this position can be found through recourse to the personality psychology literature, and most particularly to 'entrepreneur' - SME owner-manager personality research, a detailed discussion of which is given above. Shaw (1998b) in her review of the networking literature cites Jacobs and Bosworth (1989) and Gray (1991) who have stressed that "*given characteristics of autonomy and independence, most of the decision-making, and therefore determination of the small firm/s action and behaviour, may be centralised around the entrepreneur and most likely their networks.*" (Shaw 1998b: 8). Such points, are echoed by Johnston and Lawrence (1988: 94) in their discussion of value-added partnerships ("*a set of independent companies that work closely together to manage the flow of goods and services along the entire value-added chain*" *Op. Cit.*, 1988: 94) they concluded that *"In all cases, they depend largely on the attitudes and practices of the participating managers"*. In SMEs where the owner-managers have been frequently shown to possess a higher internal locus of control (Brockhaus, 1980b; Miller, 1983; Perry

et al, 1986), and a greater need for autonomy (Brodribb, 1967; Van de Ven *et al*, 1984 ; Woodworth *et al*, 1969) such 'participating managers' are likely to be the owner-managers themselves.

Curran, *et al* (1993) have gone so far as to suggest that *"The willingness of the small business owner to share information about their enterprise and to accept external scrutiny may be factors constraining formal network development"*.

Shaw (1998a: 12) in her case study based research into design businesses found that owner-managers were happy to delegate and even encourage staff *"to network with their personal contacts for the purposes of acquiring client or competitor information"* and rewarded them where the accrual of such *"information (...) resulted in case-firms acquiring new or repeat design business"* Their need for control and decision making autonomy is though demonstrated through Shaw's finding *"that they* [subordinate staff] *were discouraged from engaging in activities which the owner-managers believed would provide them with the opportunity of developing normative relationships with design clients, particularly those which owner-managers regarded as key accounts."* Owner-manager's personality and its potential affect upon network propensity and activity should therefore not be underestimated, and certainly merits further empirical investigation here.

Owner-manager personality is then, tested in the primary research reported in subsequent chapters, as the principal antecedent to a firm's co-operative propensity. Such an approach rests upon the acceptance of the fact that a relationship exists between an individual's personality traits and their behaviour, a view which is voiced by researchers active in both the mainstream psychology (Costa & McCrae, 1989) and business research fields (Kets de Vries & Miller, 1984). As has been discussed at length in the review of the personality

psychology literature, the trait-situational debate is still not resolved, and is likely to be an area of continued dispute for some years to come. This should however not be allowed to mask the importance of personality traits as potential determinants of individuals future networking behaviour. The acceptance of the interactionist paradigm (at least by mainstream psychology researchers) has meant that current discussion in the field is centred around the extent to which traits are determinants, not whether or not they in fact are.

The adoption of an empirical approach which views personality traits as being key antecedents to firm's co-operative propensity rests on the belief that in many organisations, especially micro-firms, the owner-manager is frequently the most influential, if not the only strategic decision maker within the business. This view is echoed by Miller and Droge (1986: 539) who argued that *"personality is likely to be an especially critical and perhaps overwhelmingly influential variable in small firms, in which the impact of the leader can be very direct and persuasive."*

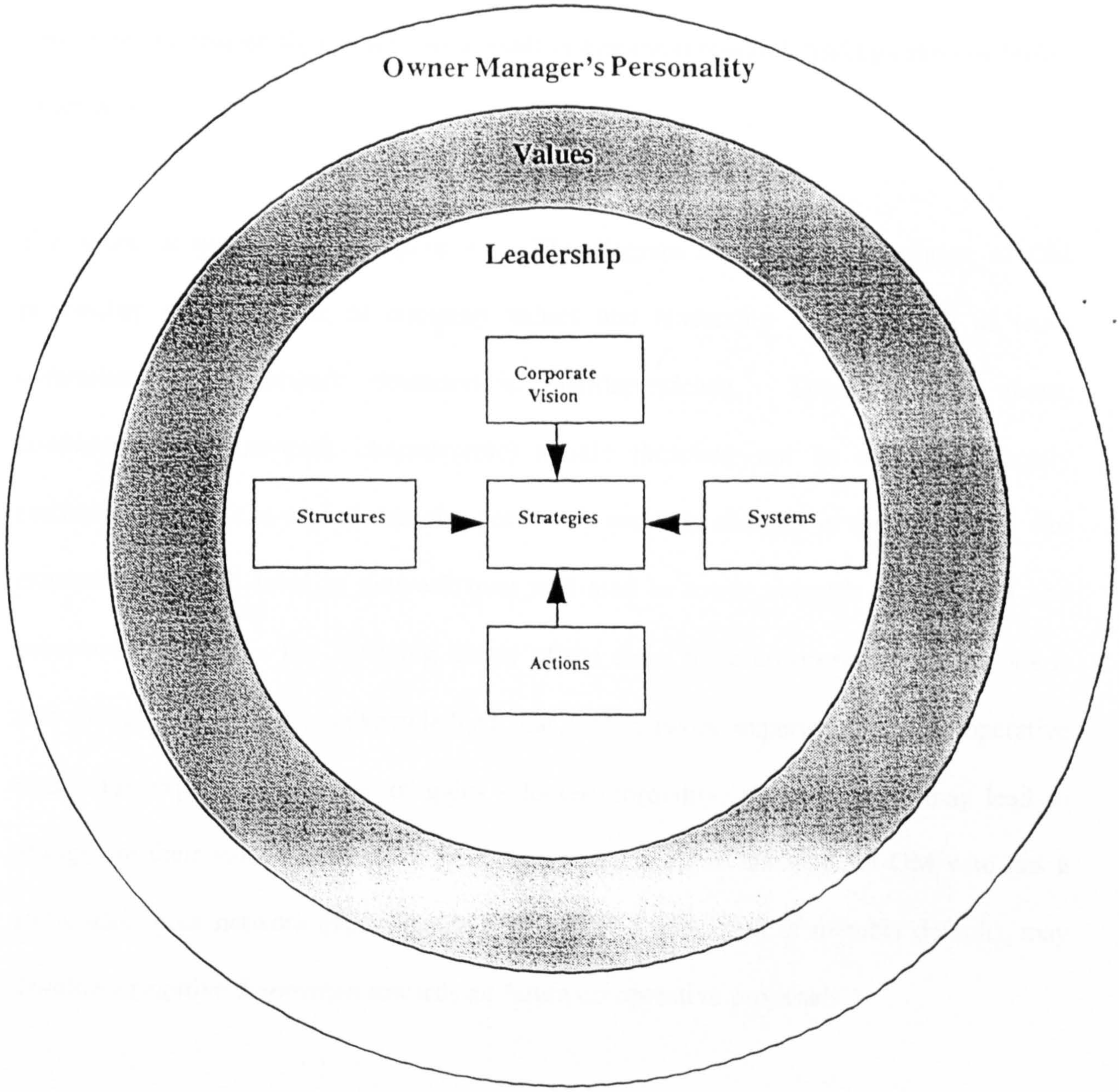
In the same study they presented empirical results, from which they were able to conclude that for smaller businesses the size of the business was: *"sometimes a less significant predictor of structure than the CEOs personality"* (Op. Cit, 1986:.553). The primary research presented here therefore follows a similar argument, and has at its heart a research hypothesis in which networking behaviour and success in SMEs, like organisational structure in MNCs, is affected by the personality of its key actor, the owner-manager.

Figure 4.2 overleaf adapted from Humble's (1992: 10) multi-national corporation model acknowledges the importance of owner-managers personality as a determinant of the organisation's values, leadership style, and the vision set for the firm and the strategies

employed to achieve it. The structures and systems that the firm adopts will also be (at least in part) determined by the owner-manager, as ultimately the way in which the firm / firm's employees act will be. The model therefore stresses the importance of OM personality as the source of company values and leadership style, as well as implicitly trust, commitment and network characteristics and interdependence. These variables (trust, commitment and network characteristic) should therefore not be seen as mutually exclusive, indeed it is argued that changes in one result in changes in the other two. For example a reduced level of network trust will lead to lower network commitment and subsequent benefits. The changing nature of the these three co-operative dimensions is also recognised, and it is acknowledged that OM network experience and co-operative results (as expressed in terms of gains - losses; formality; intensity; etc.) may lead to changes in their values, leadership style or personality. For instance, an OM who has a particularly poor network experience (e.g. high losses as a result of member default), may develop a negative disposition towards all future co-operative proposals.

The empirical research that follows will therefore seek to test the significance of owner-manager's personality as an antecedent to their co-operative propensity and activity, and in acknowledgement of the views of Miller and Droge (1986) will also evaluate the affect of the size of the firm, as well as other owner-manager and firm demographic characteristics upon their co-operative behaviour.

Figure 4.2 - Personality - An Antecedent to SME Decision Making



In the next chapter a provisional public policy model is advanced, which draws upon the attitudinal binomial classifications of autonomist-communitarians and individualist-sub-optimal realists. The model was advanced as a means of identifying OMs best positioned for network reward / success. The model recognised the limited government resources available, and the need for actor selectivity. The model (figure 4.1) is only provisional, and may therefore change significantly as a result of empirical research findings and / or broker experience.

The above is summarised in figure 4.1. The diagram stresses the importance of OM personality as the source of company values and leadership style, as well as trust, commitment and network characteristic interdependence. These variables (trust, commitment and network characteristic) should therefore not be seen as mutually exclusive, indeed it is argued that changes in one result in changes in the other two. For example a reduced level of network trust will lead to lower network commitment and subsequent benefits. The changing nature of the these three co-operative dimensions is also recognised, and it is acknowledged that OM network experience and co-operative results (as expressed in terms of gains - losses; formality; intensity; etc.) may lead to changes in their values, leadership style or personality. For instance, an OM who has a particularly poor network experience (e.g. high losses as a result of member default), may develop a negative disposition towards all future co-operative proposals.

Chapter Five - Research Methodology

5.1 Introduction

As has been discussed at length in the preceding literature review, past network research almost without exception has concentrated on the forms and frequency with which owner managers network. For the most part where empirical work has been conducted it has concentrated on the analysis of vertical linkages as characterised by sub-contractual agreements. Such agreements may, it is argued, act to constrain as well as facilitate growth (Miles & Snow, 1986) and may be little more than a monitoring exercise on the part of the larger partner, designed as a precursor to acquisition (Oakey, 1993). Little or no research has been conducted into the behaviour of small and medium sized firms involved in horizontal co-operative (i.e. those between potential competitors) or quasi-vertical agreements (i.e. co-operation between small firms active in different parts of the same value chain). A clear distinction can be made between these arrangements and the vertical agreements that have preoccupied researchers to date. Firms are, it is argued, more frequently of similar size, and as a result the power asymmetries seen frequently in vertical agreements are less common. Individual actors are therefore empowered to a level which is not evident in non-horizontal or traditional vertical linkages. Owner manager personality is therefore likely to be a significant determinant of an actor's co-operative propensity and network success. The methodology used to investigate these research issues are outlined in phase one of the research, whilst phase two examines nine business networks with heterogeneous membership, goals and objectives. Examination of these networks centres around the importance of trust, commitment, communication, in/formality and inter-personal factors.

The following section is extended as a brief review of the literature relating to the two

principal business research philosophies - phenomenology and positivism. The discussion is used as a means of demonstrating that researchers are presented with a choice of philosophies, which when chosen can effectively bias the results derived through the research conducted. The research philosophy adopted is then discussed and brief justification for that approach extended.

5.2 Principal Research Philosophies

The depth of the divisions between what is typically viewed as positivist and anti-positivist research have perhaps not been as well articulated since the introduction to the Administrative Science Quarterly's 1979 Special Issue on Qualitative Research:

"*The Seminar*

Qualitative Researcher:	*'Many people these days are bored of their work and are...'*
Quantitative Researcher (interrupting):	*'What people, how many, when do they feel this way, where do they work, what do they do, why are they bored, how long have they felt this way, what are their needs, when do they feel excited, where did they come from, what parts of their work bothers them most, which.....'*
Qualitative Researcher:	*'Never Mind'" (Anonymous, 1979: 519)*

To present the division thus is though to over simplify the matter, as has been demonstrated by amongst others Phillips (1987: 94) *"positivism arouses such negative feelings that it is often used in a blanket way to condemn any position at all that the writer in question disagrees with irrespective of how positivistic that position really is."* This position is echoed by Halfpenny (1982: 11 as cited in Phillips, 1987: 32) *"there are so many different understandings of how the term can or should be used"* that anti-positivists *"use the term loosely to describe all sorts of disfavoured forms of inquiry"*. Lincoln and Guba (1985: 24) are even more damning in their attack on anti-positivists' use of the positivist label: *"positivism can be reshaped, apparently, to suit the definer's purpose ... One might venture to say that the particular form of definition offered by any commentator depends heavily upon the counterpoints he or she wishes to make"*.

Having then established that positivism is a philosophy which has been widely abused and misused there is clearly a need to define it so as to avoid such ambiguity here. Such discussion should naturally commence with the consideration of the work of Comte (1830-42 / 1853), positivism's most notable early advocate. Comte held *"that the highest or only form of knowledge is the description of sensory phenomena"*. Comte's position is frequently labelled traditional empiricism, and as such is *"confined ... to what is positively given, avoiding all speculation"*. Since Comte the positivist perspective has moved on from Comte's own work in which it was articulated as *"optimism about the scope of science and the benefits of a truly scientific sociology"*. Today positivism incorporates schools which focus more on the teachings of idealism (e.g. Berkeley, 1988) and scepticism (e.g. Hume (Miller, 1981)). Given the number of number of directions in which positivism has moved since Comte, it is not possible to offer a single definitive definition,

recourse will be made to the various elements which researchers have articulated in the past.

The classical positivist position is summarised by Sarantakos (1998: 37):

"For positivists, human beings are rational individuals who are governed by social laws; their behaviour is learned through observation and governed by external causes that produce the same results (the same causes produce the same consequences). There is no free will. The world is, however, not deterministic; causes produce effects under certain conditions, and predictions can be limited by the occurrence of such conditions."

The classical positivist position was therefore heavily deterministic, and has been described in the past through reference to the 'machine metaphor' *"in which reality is perceived as a machine-like event determined by forces and constraints"* (Tompson et al, 1989: 137).

A parallel is often drawn between positivism and naturalism, both share the view that the world in which we live can be explained. Hondenrich (1995: 604) argues that naturalism is:

"In general the view that everything is natural, i.e. that everything there is belongs to the world of nature, and so can be studied by the methods appropriate for studying that world, and the apparent exceptions can be somehow explained away."

Positivism's distractors have argued that whilst appropriate for the natural sciences such an approach is wholly inappropriate for the social sciences in which far more factors are at play, and in which far more outcomes are possible for any given event. As is demonstrated

by Hughes (1990: 59) a paradigm should not be rejected though simply because its continued use is challenging, *"the relative complexity of the social sciences and the relatively greater number of social phenomena compared with the subject matters of the natural sciences"* do indeed make its application more difficult but not inappropriate. Phillips (1987: 55) argues that *"The differences between the social and physical domains is merely that the types of factors that interact are different"*. William and May (1996: 82) support Phillip's point through recourse to Bohman (1991): *"physical and social sciences are not fundamentally different, though each must elaborate its explanations in ways appropriate to its subject matter"*.

Another quarter upon which the positivist philosophy has been attacked is its use and acceptance of induction (*"the derivation of a general principle (or possibly a law in science), which is inferred from specific observations"* Williams and May, 1996: 22). Williams and May (1996: 23) criticise such a position on the grounds that it is not 'safe', as *"not even the sun rising tomorrow is a certainty"*. They continue their argument by offering support for it through reference to the Ptolemic geocentric model in which the heavens were considered to rotate around the earth. Whilst this model has been proven to be flawed, and has been replaced by Copernicus's, Ptolemy's model it *"still works perfectly well as a means of navigation ... Far from being 'irrational', or 'unscientific', belief in the geocentric model was backed up by good solid observation and even though an inaccurate representation, it accurately predicted phenomena; for instance, the earth's distance from the moon."*

The absence of certainty though, should not invalidate a theory. Simply because a theory cannot be proven beyond doubt, does not mean that it is not capable of being correct. Unless such theories are extended, there are no foils against which others can compare their

own work, and without them 'knowledge' will stagnate. The debate thus moves onto one of 'truth', and the various paradigms position on it.

Under the positivist or objectivist perspective view, the world *"as a concrete structure encourages an epistemological stance that emphasizes the importance of studying the nature of relationships among elements constituting that structure. Knowledge of the social world from this point of view implies a need to understand and map out the social structure, and gives rise to an epistemology of positivism, with an emphasis on the empirical analysis of concrete relationships in an external social world. It encourages a concern for an 'objective' form of knowledge that specifies the precise nature of laws of regularities, and relationships among phenomena measured in terms of social 'facts' [Pugh & Hickson, 1976a, 1976b; Skinner, 1953, 1957]."* (Morgan & Smircich, 1980: 493).

Positivism therefore implies a position in which individual's perceptions of an object are shared and uniform. In contrast, subscribers to reality relativism / constructivism (Hunt, 1990) view an individual's perception as unique, as a result of which they argue that 'multiple realities' exist, all of which are 'equally valid'. Blackburn (1994: 326) makes the same point through recourse to a familiar metaphor *"truth itself is relative to the standpoint of the judging subject ('beauty lies in the eye of the beholder')"* By subscribing to this standpoint researchers are essentially stating that are unable to draw conclusions beyond themselves and their own experiences. Research therefore becomes a pointless and nihilistic exercise. *"[I]f reality relativism were true, and scientist's theories did not 'touch base' with some reality external to the theorist, the pragmatic success or usefulness of science over the last 400 years would be totally inexplicable, that is. a 'miracle' (Harre,*

1986; Leplin, 1981; Putnam, 1978)." (Hunt, 1990: 3). Anti-positivists would of course argue that the last four hundred years of scientific discovery may go the same way as Ptolemic principle, an argument which is, however unlikely, of course impossible to refute. To return to Blackburn's metaphor of beauty, whilst perceptions do indeed vary, a common ground can generally be identified which a group of individuals could readily label 'beauty'. Common sense therefore seems to favour a middle ground between the positivist and reality relativist camps, a point which will be discussed later in this review.

As is evident from the above example, the positivist tradition is inherently reductionist: *"According to Giddens and Turner (1987), the principal goal of positivistic sociological theory is to reduce the number of laws so that 'only basic fundamental and invariant properties of the universe are subject to theoretical analysis"* (Robson & Rowe, 1997: 658). The goal of a positivist would therefore be to extend a model of beauty which all individuals would be expected to accept, there would be no room for manouvere or for personal preference. In contrast one of the most en-vogue anti-positivist positions, post-modernism rejects 'laws' arguing that the world is too chaotic for them *"to have anything but a temporal existence"* (Robson & Rowe, 1997: 660). Post-modernists though offer nothing in their place, *"Postmodernism does not endorse any one approach, not even postmodernism"* (Brown, 1995: 182 as cited in Robson & Rowe, 1997: 660).

A defence for the extension and adoption of 'laws', and a rejection of post-modern approaches can be found in what Hunt (1990) has referred to as marketing's 'crisis literature'. Robson and Rowe (1997: 662) commenting on this crisis argue that *"marketing theory cannot move on insofar as theory building is concerned, unless it provides empirical-causal connections in research to allow laws and conceptual frameworks to be referenced in a more abstract way."*

As has already been stated above these causal generalisations, based as they are on evidence collected in the past and present cannot be guaranteed to hold in the future, *"knowledge of empirical connections, of cause and their effects, is never certain but only probable; that is, we can never have absolute confidence in their repeated connection in the future"* (Hughes, 1990 : 49). If then, as Williams and May (1996: 45) suggest the *"whole raison d'etre of the philosophy of science can be said to be the quest for a method of doing science and of defining its nature in the process."* Surely, the positivists claim to having found the 'holy grail' is as sound as any others. In order to answer this question effectively, we must consider the position of positivism's distractors.

As has already been to some extent elucidated the positivist philosophy is not without its challengers, the 1960s saw the emergence and growth of the phenomenologist - subjectivist perspective, and it is from this quarter that most resistance to positivism has emerged.

Whilst not all commentators share his view, Campbell (1978: 184) acts to highlight the prevalence of philosophical and methodological ambiguity in the social sciences, suggesting that the various approaches can in effect be lumped into two camps: *"For quantitative read also scientific, scientifistic, and naturwissenschaftlich: for qualitative read also humanistic, humanitistic, geistewissenschaftlich, experiential, phenomenological, clinical, case study, field-work, participant observation, process evaluation, and common sense knowing."* Whilst Phillips (1987: 96) argues that this is not strictly speaking true (*"a positivist, qua positivist is not committed to any particular research design . There is nothing in the doctrines of positivism that necessitates a love of statistics or a distaste for case studies"*) this is the popular misconception, and to avoid excessive complication of the issue here, it is this misconception that will be addressed.

The Phenomenologist - subjectivist's view then is one of *"reality as a projection of individual imagination"* and as a result they *"dispute the positivist grounds of knowledge in favor of an epistemology that emphasizes the importance of understanding the processes through which human beings concretize their relationship to the world. This phemenologically oriented perspective challenges the idea that there can be any form of 'objective' knowledge that can be specified and transmitted in a tangible form, because the knowledge thus created is often no more than an expression of the manner in which the scientist as a human being has arbitrarily imposed a personal frame of reference on the world, which is mistakenly perceived as lying in an external and separate realm [Husserl, 1962]. The grounds for knowledge in each of these perspectives are different because the fundamental conceptions of social reality to which the proponents of each position subscribe are poles apart."* (Morgan & Smircich, 1980: 493).

Some researchers, such as Morgan and Smircich writing in 1980 have warned of the dangers of a shift from one form of abstracted empiricism to another, quantitative (positivist) to qualitative (phenomenological). Eighteen years later it can be argued with some confidence, that although social sciences as a whole is seeing a paradigm shift from positivisit to phemenology based research methods, arguments that "one kind of abstracted empiricism will be replaced by another" (*Op. Cit.*, 1980: 493) have so far proven to be ill founded.

Although the phenomenological approach is strong within social sciences as a whole, it is still struggling to achieve mainstream acceptability within the business research arena. It would be wrong to suggest that phenomenology is without its proponents within business research, it is merely the case that large numbers of researchers are oblivious to their calls

for a fundamental reorientation within the field. Mintzberg (1979: 584) argued in favour of the phenomenological paradigm nearly twenty years ago: *"that the more deeply we probe into this field of organizations, the more complex we find it to be, and the more we need to fall back on so called exploratory, as opposed to 'rigorous,' research methodologies".*

Podsakoff and Dalton (1991: 124) cite Machiavelli (1532 / 1952: 49-50) as an authority on the difficulties inherent in attempts at persuading researchers to shift their efforts from the positivist to the phenomenological paradigm:

"It must be considered that there is nothing more difficult to carry out, no more doubtful of success, nor more dangerous to handle, than to initiate a new order of things. For the reformer has enemies in all those who profit by the old order, and only lukewarm defenders in all those who would profit by the new order... who do not truly believe in anything new until they have had actual experience of it."

Despite the laudable arguments of its advocates, positivist approaches still prevail within business research, and will probably continue to do so for the foreseeable future. Significant 'barriers to entry' still exist, which researchers wishing to pursue phenomenological research methods still need to overcome. Smith (1991: 222) argues that the phenomenological philosophy is particularly hazardous for individuals involved in doctoral research. Whilst he acknowledges that methods such as those advanced by Glaser and Strauss (1967) have much to offer *'established and experienced researchers'*, he questions its appropriateness to doctoral research stating:

"(...) can it realistically be considered appropriate to doctoral research? The dependence on what amounts to serendipity is unacceptable. In all research there is an element of

chance, but if one is so unfortunate as not to substantiate the hypotheses under test, at least one has something to say. This is not the case if one is still waiting for a theory to emerge from the data, when there is nothing to report. Indeed, if the researcher follows the advice of Howard and Sharp, and ensures that the hypotheses are designed and tested such that there is a symmetry of outcomes, then researcher's risks are minimized (Howard and Sharp 1983: 37-9). Although, one might also argue, so is the likelihood of having anything significant to say." (Smith, 1991: 222).

Smith (1991: 223) argues that the doctoral researcher is effectively coerced into following the hypothetico-deductive positivist route, and concludes by arguing that *"there is little alternative in the doctoral research context if the student wishes successfully to complete - other than relying on serendipity."*

Doctoral researchers however are not alone in facing difficulties when employing the phenomenological paradigm; experienced researchers may also faced problems relating to non-completion. Taylor and Bogdan (1984: 67) in their discussion of participant observation, observe that: *"Participant observers almost never reach a point when they feel that the studies are complete. There is always one more person to interview, one more loose end to tie up, or one more area to pursue."*

Bate (1997: 1151) in his identification of some of the difficulties inherent in ethnographic research, cites time investment as a significant issue:

"One full-length published ethnography every three years (which is quite good going) is not likely to satisfy the 'ratings' merchants or one's head of school; and sabbaticals that used to permit a full-time period in the field are no longer available to the majority. In the

present climate, Rule 1 for aspiring organization researchers surely has to be: keep away from organizations; fieldwork takes too long!"

Podsakoff and Dalton (1991: 124) also argue that there is a clear link between the research orientation adopted and the reward received through its pursuit:

"If publications can be considered rewarding, it seems clear that the use of traditional methods have been generously rewarded. In fact, based on this review, it seems that organizational researchers using the predominant paradigms (which as we noted generally are well articulated and therefore have less ambiguity associated with their use) are likely to be rewarded just as much, if not more, than the researchers who undertake nontraditional research methods. All else equal, it would be difficult to dissuade individuals from conducting research in the same fashion if they continue to be rewarded for it."

Podsakoff and Dalton's point is echoed by Everend and Reiss Louis (1991) who argue that *"good research of either kind should get published with equal facility. This requirement is not currently being met, there is a strong bias towards inquiry from the outside."*

In choosing research philosophy Bonoma (1985) argues that researchers are trading data integrity (reliability) for results currency (validity) or vice versa (see Figure 5.1 below). He supports his own argument through recourse to McGrath (1982) who suggests that:

" (...) all research strategies are seriously flawed, often with their very strengths in regard to one desideratum functioning as serious weaknesses in regard to other, equally important

goals. Indeed, it is not possible, in principle, to do 'good' (that is methodologically sound) research." (Bonoma, 1985: 200).

Other researchers have been even more explicit and strident in their argument, suggesting that *"investigators who adhere to a particular paradigm tend to bias their studies in line with the paradigms in many ways - in the kinds of questions that they ask, in the methods they use to answer the questions, and in the way that they interpret their data."* Barber (1976: 9).

Arguments relating to philosophy bias are most often levelled at phenomenological approaches, but as has been demonstrated above are equally applicable to the positivist approach. Sandays (1979: 529) research relates to ethnographic methods, but a similar point can be made for phenomenological research as a whole. *"Since the ethnographer filters the data, the question arises as to whether we treat the product as science, art, journalism, or even fiction."* Miles (1979: 591) argues that even 'grounded theory' research requires a *'rough working framework'*, without which, *"the risk is not that of 'imposing' a self-binding framework, but that an incoherent, bulky, irrelevant, meaningless set of observations may be produced, which no one can (or even wants to) make sense of."*

Mile's point is echoed by Donaldson (1997: 87) who argues that the net result of such *"vague schema (...) is that the researcher must record every sparrow that falls. (...) In short the task is herculean."*

Even if a phenomenological researcher avoids a truly 'grounded' approach they will still be open to criticism from their positivist peers, who will still refer to the high levels of subjectivity within their research; the inherent risk of collecting information which may

ultimately prove to be limited use; ethical issues relating to collecting information through 'entering the personal sphere of the subjects', and poor representativeness and generalisibility of the results dervied (Chadwick, Barr and Albrecht, 1984: 214-215).

Given the sheer quantity of information that needs to be collected in order to do justice to the phenomenological paradigm, it is understandable (if not justifiable) if the researcher filters the information he/she collects whilst still in the field. Van Maanen (1979: 548) makes this point in relation to his own work on police organisations. *"[M]isdirection in fieldwork arises from several sources not least of which is the ethnographer's own lack of sensitivity for the discrepant observation and lack of appreciation for the tacit bases of one's own understanding of the social world. The vast majority of what is unremarkable to me about police organziations is therefore underrepresented in my writings."*

Crabtree and Miller (1992: 68) support Van Maanen whilst at the same time highlighting the skills required to be a successful participant observer. They state, that is is *"essential that the researcher be capable of 'seeing' what is before him or her, rather than what he or she is accustomed to seeing. This does not require genius; it* requires practice. *It is a skill that can be developed."*

Even when field data has been collected successfully, the phenomenological researcher still faces further barriers to completion of what might be deemed 'satisfactory' research. Sieber (1976) as cited in Miles (1979: 595) in his analysis of accepted texts on field methods (which included Glaser and Strauss, 1967; Filstead, 1970; Glaser, 1972; Runkel and McGrath, 1972; Schartzman and Strauss, 1973; Bogdan and Taylor, 1975; Smith, 1975) *"found that most of the texts largely ignored the problem of analysis, typically devoting not more than 5 to 10 percent of their pages to it."* This led Miles (1979: 595) to

conclude that *"others did not know much more than we about the arcane process of making valid sense of large amounts of qualitative information."*

In addition to the time / monetary costs and the potential difficulties in publishing research once completed, the phenomenological researcher faces another significant obstacle, access to the organisation and or individuals in which he/she is interested. This point is well made by Bonoma (1985: 206) who suggests that *"access to corporations* appropriate for the research objectives *may not be as easy as obtaining student subjects or the resources necessary for mail questionnaires."*

Finally, as has already been suggested, phenomenologists need to possess a higher skills base than their positivist counterparts. In particular, such an approach places greater demands upon their analytical and interpersonal skills. Crabtree and Miller (1992: 45) demonstrate this point in relation to participant observation through reference to Bernard (1988: 148). *"If you are a successful participant observer you will know when to laugh at what your informants think is funny; and when informants laugh at what you say it will be because you meant it to be a joke."*

The literature presented until now has given something of a one-sided view, and the reader could be forgiven for thinking that the phenomenological philosophy is without merit. The next section therefore seeks to redress this imbalance, by considering the benefits of the phenomenological paradigm, and thus the implicit weaknesses of the positivist approach.

5.2.1 Phenomenological Strengths and Positivist Weaknesses

Phenomenologically based research programmes will certainly be extremely useful where the individuals being studied are likely to be less responsive to self-report based methods. This point is made by Webb and Weick (1979: 651) who argue that *"self-report ... remains the dominant style of measurement because investigators have dealt continually with articulate populations. Less articulate populations, because they had neither time nor interest nor talent to work with self-report measures, are underrepresented in organizational research."*

Miles (1979: 500) argues that the grounded nature of many of the qualitative research methods offer *"attractive qualities for their producers and consumers; they lend themselves to the production of serendipitous findings and the adumbration of unforseen theoretical leaps; they tend to reduce a researcher's trained incapacity, bias, narrowness, and arrogance; and their results, reported in forms ranging from case studies to vignettes, have a quality of 'undeniability' (Smith, 1978) that lends punch to research reports."*

The most frequently cited strengths of phenomenology based qualitative research techniques are well summarised by Chadwick, Barr and Albrecht (1984: 214) who state that such approaches enable research to be conducted which duly considers the context in which the individuals being studied are to be found; places greater emphasis upon the interpretations and meanings of results reported; acts to humanise the research produced by increasing the role of the individuals researched; allows the researcher greater flexibility when conducting their research, and ultimately enables a deeper understanding of the respondent's world than could have otherwise been achieved through use of positivist based methods.

Even given the above, qualitative methods are often shunned simply because they represent a more difficult approach. Qualitative approaches as Sarantakos (1998: 256) suggests are very much the harder art. *"[Q]ualitative [methods] are far from a soft methodological option and an easy form of research. On the contrary, conducting qualitative interviews is a difficult task, which meets certain important and also difficult requirements and demands. It is generally accepted (e.g. Lamnek, 1988: 86; Pannas, 1996: 76-9), for instance, that although they involve a few typical cases, qualitative interviews: require the development of trust, collegiality and friendship between interviewer and respondent; require a high competence on the part of the interviewer; require a high ability of the respondent to verbalise views opinions and ideas; are demanding and time consuming."*

The following section therefore considers the alternative paradigm positivism, to determine whether researchers simply adopt such an option as the path of least resistance, or whether where is in fact some merit in such an approach.

5.2.2 The Positivist Paradigm

As is evident from the previous discussion the positivist paradigm has fallen out of favour in recent years, a point acknowledged by Turner (1992: 156): *"It is somewhat unfashionable these days to proclaim oneself a positivist, especially in social theory circles where we have been inundated with European 'sophistication' - phenomenology, hermeneutics, structuralism, critical theory, and the like."*

Discussion within the positivist arena has gone full circle in that J. S. Mills comments in his translation and advocacy of Comte's works (as has already been noted in preceding sections) is as true now as it was then: *"Indeed, though the mode of thought expressed by the terms Positive and Positivism is widely spread, the words themselves are, as usual, better known through the enemies of the mode of thinking than through its friends"* (Mill, 1973: 2). The following section therefore seeks to present a defence of positivist philosophy. In addition, the inherent weaknesses of this approach will be identified.

The hypothetico-deductive approach adopted within this research has made heavy use of survey based research methods, with this in mind, the positivist discussion extended in this section will focus for the most part on these methods.

Sarantakos (1998: 224-5) presents a good summary of the literature relating to both the advantages and disadvantages inherent in employment of questionnaire based research. In its defence he argues that it often represents a system less expensive and easier to administer than its qualitative alternatives. In the words of Sellitz *et al* (1976: 24) *'questionnaires can be sent through the mail; interviewers cannot'*. In addition such methods represent a quicker alternative for their users, and as a result offer more timely and pertinent information than can generally be achieved through alternative approaches. Survey based methods are particularly useful where the field being studied is prone to rapid change, or where qualitative techniques employed are extensive (e.g. mulit-firm, multi-individual or longitudinal studies).

Other advantages which survey methods provide include anonymity for the respondent (and as a result, arguable increases in the reliability of the results derived); convenience for participants, as the survey can be completed at a time of the respondent's choosing; the

instrument is stable and consistent, it is therefore possible to be certain that all respondents have been asked the same question(s) (whether all respondents *interpret* the instrument in the same way though is debatable); linked to the convenience issue, is the increased objectivity that questionnaires have the potential to provide, as is it possible for respondents to consult company records and other internal documentation. In addition, and perhaps most significantly, questionnaires enable the researcher to reach a wider number / cross section of the individuals / parties being investigated, thus enhancing the generalisability of the results derived.

It would be wrong to suggest that survey based research methods are without their pitfalls, perhaps the most damning of these is articulated by Webb and Weick (1979: 651) who suggest that users of such techniques despite "*acknowledge that self report involves small ideas generated by overly surveyed people that are overinterpreted, yet they continue to collect such data.*"

Additional disadvantages of this method include the fact that they do not enable the researcher to encourage individuals / firms to participate in the research, determine why the respondent has answered a question in a particular way, or clarify what they meant by answering in the way that they did. It is never possible to be certain that the questionnaire has in fact been filled out by the right person, or if it has whether it was answered with the requisite attention to detail; finally, because the respondent is not supervised, it is possible for them to answer only the questions they wish to answer, thus rendering their response of limited use, or even useless (Sarantakos, 1998: 225).

More general criticisms of the positivist approach have been offered by numerous researchers. McNeill (1990: 119) argues that positivism in the social sciences fails to

acknowledge that "*What makes social events social is that all those involved give it the same meaning. They all interpret what is happening in broadly the same way. If they do not, social interaction cannot take place. If we are to explain some event in the social world, our explanation has to take into account what the people involved feel and think about it.*" This is the point at which positivist (or at least quantitative) approaches fall short, even where attempts are made to determine individual's perceptions, it is not possible through such methods to determine why they hold such views. McNeill (1990: 119) therefore argues that "*We* [researchers] *must not think of them* [respondents] *simply as helpless puppets.*"

Behling (1991: 46-7) articulates the views of many of positivism's opponents, and extends a five point critique of the paradigm. Such an approach he argues, through its development of 'general laws' fails to acknowledge the uniqueness of organisations, groups and individuals. It fails to recognise that "*the phenomena of interest to researchers in organizational behaviour and organizational theory are transitory. Not only do the 'facts' or social events change with time, but the 'laws' governing them change as well. Natural science research is poorly equipped to capture these fleeting phenomena.*"

As well as being unique and unstable, Behling argues that individuals unlike their natural science equivalents (e.g. chemicals) are inclined to react differently when they know they are being studied, the classic example of this observation being the Hawthorne experiments.

Fourthly, it is argued, that such methods simply are not realistic. Manipulation and control of the variables of interest, means that results derived are not representative of the 'real world'.

Finally, Behling cites the epitemenological differences between the natural sciences and social science, he argues, that *"a different kind of 'knowledge' not tapped by this approach is more important in organizational behaviour and organizational theory."*

Research Philosophy and Research Bias

The inescapable fact of any consideration of research philosophy irrespective of which of the prevailing research philosophies is actually adopted, is the fact that represent a significant source of research bias. The positivist paradigm with its focus on the discovery of invariant laws, blinds itself to the possibility that not all actions can be rationalised in this way. Conversely, the non-positivist paradigm, with its belief in multiple realities effectively rejects the pursuit of knowledge, and the possibility that laws may exist which may be held in common *within* those multiple realities.

Given the above, research philosophy selection is inherently one of personal preference, a paradigm which is acceptable for one individual may be entirely unpalatable to another. Ultimately however, research results should not be accepted or rejected on the basis of the research philosophy they adopt, but rather should be mediated against that background, in the knowledge that they will have limitations, and what those limitations are likely to be.

The research outlined in this document has taken a largely neo- / cognitive behaviourist research philosophy. Cognitive behaviourism shares its predecessor's (behaviourism) belief that *"Its theoretical goal [should be one] of prediction and control of behaviour"* (Watson, 1948: 457). Neo-behaviourism differs though in terms of approach to

'consciousness', which traditional behaviourists (in the positivist tradition) rejected on the grounds that *"only behaviour is observable, and only by focussing on this can psychology become objective"* (Phillips, 1987: 41). In contrast, neo-behaviourists *"no longer avoid reference to inner psychological causes and events, but ... construe these so as to allow empirically detectable consequences"*. Support for this shift in emphasis was found in what Bandura (1977: 10) referred to as the *"growing evidence that cognition has causal influence on behaviour"* and as a result *"the arguments* [as advanced under the traditional positivist postion] *against the influence of internal determinants began to lose their force"* (Bandura, 1977: 10 as cited in Phillips, 1987).

Such an approach can be seen as falling with the auspices of what Hunt (1990) refers to as scientific realism, which he argues occupies the middle ground between the standpoints of direct realism (congruent with what is largely presented here as positivism) and reality relativist / constructivist (also referred to here as the phenomenolgist - subjectivist approach) is occupied by scientific realism in which the world is considered as existing independently of its being perceived by individuals (in this regard it is congruent with direct realism), and as a result *"there really is something 'out there' for science to theorize about"* (Hunt, 1990:11). Hunt in his defence of scientific realism states that *"(1) the world exists independently of being perceived (classical realism), (2) the job of science is to develop genuine knowledge about the world, even though such knowledge will never be known with certainty (fallibilistic realism), and (3) all knowledge claims must be critically evaluated and tested to determine the extent to which they do, or do not, truly represent or correspond to that world (critical realism)."* (Hunt, 1990: 12).

Whilst sharing some common ground with the positivist paradigm the neo-behaviourist - scientific realist approach employed here cannot be said to be purely positivist. At the

same time as embracing positivist notions of observable causes and effects, it recognises that not all causal factors will be *strictly* observable. Unlike Comtean positivism or logical positivism that followed it, it is not marked by the same level of hostility towards all things meta-physical. Consciousness, and more specifically individual's attitudes and values, lie at the heart of this thesis, and as they are strictly speaking unobservable (meta-physical) entities the research conducted whilst being positivist in spirit cannot be said to be entirely positivist in practice.

The results that have been presented and conclusions that have been drawn from them, as reported here, in line with Popper (1976: 86) are therefore presented in the Darwinian spirit for *"**selection** by the environment"* (academia)*: "From the point of view of this methodology, we start our investigation with **problems**. We always find ourselves in a certain problem situation; and we choose a problem which we hope we may be able to solve. The solution, always tentative, consists in a theory, a hypothesis, a conjecture"*

Phillips (1987: 56) concludes Popper's argument: *"This conjecture is tested; relevant data are collected, resulting in either refutation, modification, or (if the test is passed) slightly less tentative acceptance of the original conjecture."*

The emphasis in this document is therefore very much upon drawing tentative conclusions, it lays no claim to epoch creation, but rather offers a pandora's box of research possibilities and hypotheses that others may wish to test in the future. No apology is made for this position. To adapt a quote from Phillips (1987: 199), *"Research is directionless unless it is guided by some hypothesis* [philosophy] *or heuristic device, and possibly anything is better than nothing."* Given the lack of primary research into business networks and co-operative activity the cognitive behaviourist - scientific realist and largely quantitative

approach that has been adopted would appear to be a reasonable one. In no way however, does its adoption suggest philosophical supremacy, a more qualitative research philosophy would have been just as valid, and indeed can be expected to bear considerable fruit in this field. This said however, the extreme relativist / constructivist approach is rejected here on the grounds that *"[i]n essence, all researchers who share their research with clients implicitly state: 'Trust me.' One consequence of that trust is that any research project guided by a philosophy maintaining that the research does not 'touch base' with a reality external to the researcher's own linguistically 'encapsulated theory, or 'paradigm,' or 'research tradition' would provide no grounds for the client trusting the knowledge claims of the researchers. Thus, philosophies like reality relativism and critical relativism that abandon truth are not only self-refuting for their philosophical advocates, but also self-defeating for practising researchers"* (Hunt, 1990: 15)

To summarise then, an approach which owes nothing to the positivist tradition has not been adopted for this research programme on the grounds that to reject positivism is to: ignore its past success in the natural sciences; reject theory building on the ground that it is impossible to conceptualise anything other than one's own reality; accept that the additional complexity of the social sciences precludes a 'scientific' approach. Whilst not without its merits, it has been demonstrated that a non-positivist approach is not without its dangers, especially for the doctoral researcher. The non-positivist approach places greater demands upon its adopters; requires superior inter-personal skills; requires that information be collected on everything, no matter how seemingly trivial it may seem at the time of collection; will take considerably longer to collect data; lacks a commonly accepted analytical framework and publication of results may prove very difficult.

All of the preceding discussion, whether related to phenomenological or positivist research has in effect acted to highlight the weaknesses of both paradigms and has thus indirectly identified the potential for complementary use of the two philosophies. The following section considers the two methods explicitly as complementary methods, and considers in particular the significant advantages that triangulation methodology can provide.

5.2.3 Positivism and Phenomenology as Complementary Methods: The Role for Triangulation

Marsden and Littler (1996: 654) in their discussion of research philosophies in marketing argue in favour of complementary / supplementary use of research paradigms. In their critique of the positivist paradigm they stressed that "*This is not to suggest, however, that positivism should be abandoned, but rather that it should be complemented by alternative paradigms such as social constructivism with its strong emphasis on the consumer's view of the world. Rather than seek an overall explanation from one particular marketing paradigm, the prudent marketer should try and derive insights and knowledge from different perspectives and methodological approaches.*"

Marsden and Littler's contention is supported by the earlier work of Bonoma (1985: 202) who argues very much in favour of *appropriate* use of research methods, and argues that the appropriateness of a positivist - quantitative approach can be determined through reference to two factors: "*One is whether the phenomenon can be studied usefully outside its natural setting. The second is whether it is amenable to quantification.*"

The same point was made even earlier by Kaplan (1964: 214) (as cited in Downey and Ireland, 1979: 630), who also identified the frequent myopia inherent in large sections of business research - why measure it all? *'Too often, we ask how to measure something without raising the question of what we would do with the measurement if we had it.' Thus, both qualitative data and quantitative data have their place in organizational research. The pertinent questions concern the 'where's' and when's' within a specific research context."*

Evered and Reiss Louis (1991: 17) in their advocation of their own model of inquiry 'from the inside' (largely congruent with the phenomenological philosophy), and inquiry 'from the outside (largely congruent with the positivist paradigm) argue that the two methods can be used effectively to overcome the shortcomings of each other.

"Organizational inquiry is currently characterized by two broad approaches. One is methodologically precise, but often irrelevant to the reality of organizations [positivism]*; the other is crucially relevant, but often too vague to be communicated to or believed by others* [phenomenology]. *(...) In addition to improving the quality of both modes of inquiry, researchers should explore ways of combining them, with the aim of securing the strengths of each while avoiding their respective deficiencies.*

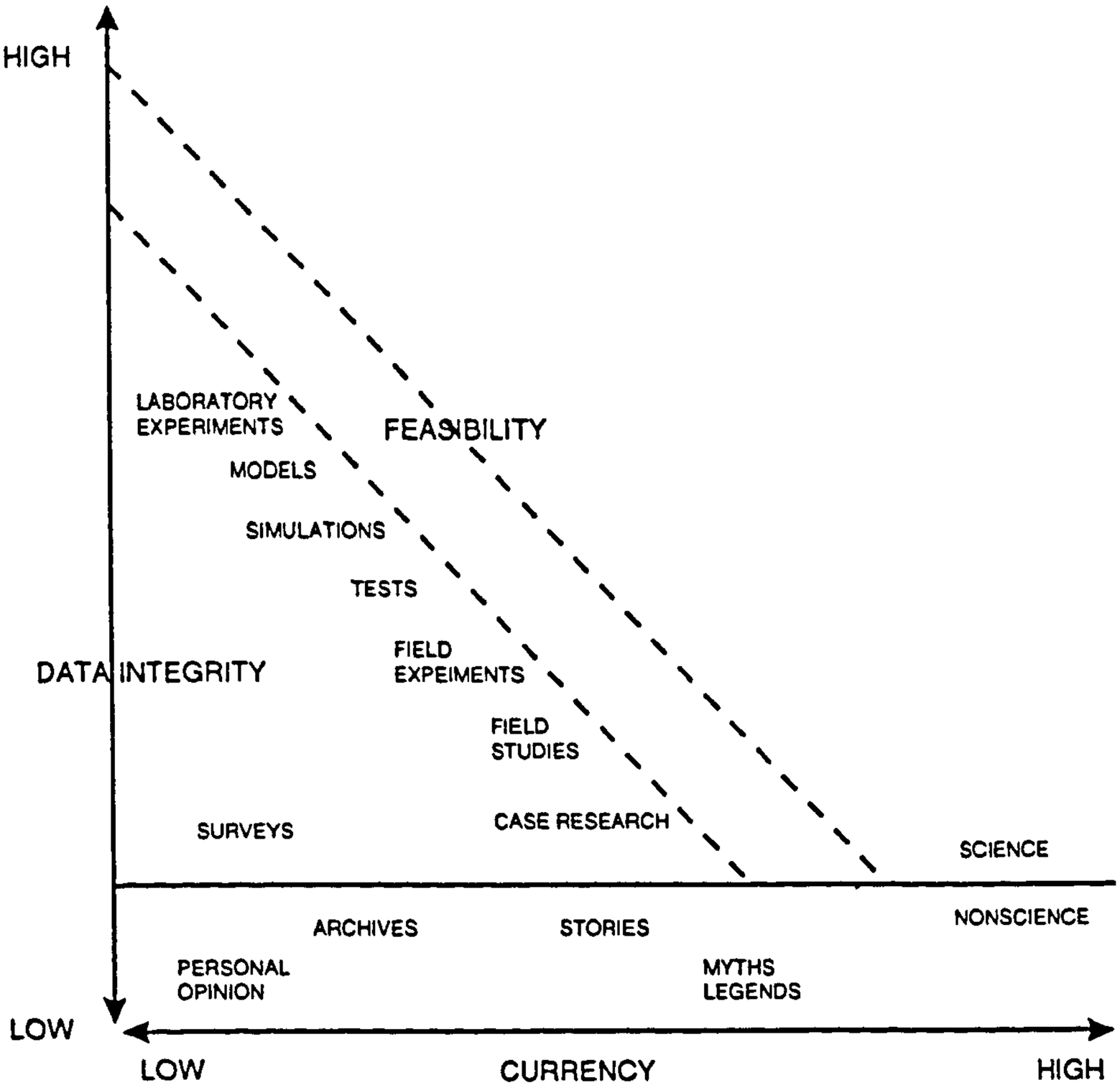
Evered and Reiss Louis (1991: 17) continue their argument by suggesting that two approaches are open to researchers who are prepared to make use of both methods *"Do both and aggregate"* or *"Alternate between the two modes"*.

'Multi-trait-multi-method' approaches such as those described above, and as originally advocated by Cambell and Fisk (1959) are not always feasible. Bonoma (1985: 201) cites

Martin (1981) to illustrate this point. As Martin (1981) points out, *there often are technological and expense barriers to using triangulation within any one research project."* As a result of which "*Ordinarily, science implicitly relies on 'interproject' triangulation to help accrue a body of knowledge satisfying the two desiderata of integrity and currency.*" (see Figure 5.1)

Triangulation's distracters implicitly argue in favour of research philosophy / method purity, arguing quite rightly that *"In all the various triangulation designs one basic assumption is buried. The effectiveness of triangulation rests on the premise that the weaknesses in each single method will be compensated by the counter-balancing strengths of another. (...) Although it has always been observed that each method has assets and liabilities, triangulation purports to exploit the assets and neutralize, rather than compound the liabilities."* (Jick, 1979: 604).

Figure5.1
A KNOWLEDGE-ACCRUAL TRIANGLE



5.2.4 Research Philosophy and this Study

The research philosophy employed throughout this study can most readily be categorised as the positivist approach. As is evident from preceding sections a researcher's choice of paradigm is essentially one between scope (the positivist approach) and depth (the phenomenological approach). Although it is clear that both have merit, given the dearth of empirical research into SME co-operation and networking activities the most benefit through this research it was felt could be derived from a positivistic approach in which a number of specific hypotheses were tested through the use of two standardised questionnaires administered to large samples (BEMA members, SME owner-managers and members of specific business related networks).

The adoption of a largely positivist paradigm (cognitive behaviourist - scientific realist) here, as is evident from earlier discussion relating to triangulation and complementary use of research philosophies, is in no way intended as a rejection of the validity of phenomenological - qualitative approaches. Indeed it was in large part through utilisation of the later method, that the research aim hypotheses and standardised questionnaires discussed in this study were devised. The emphasis in the research presented here has therefore favoured scope over depth. Use could clearly be made of phenomenological techniques such as case study analysis of successful and unsuccessful networks or inter-firm co-operative arrangements; network broker shadowing; network or firm involvement or establishing and / or managing a business network(s). Such approaches recognise the fact that the social world, of which business is a part, differs from its natural world counterpart in so much as the subject under study (human beings) possess consciousness and as a result make decisions based upon past experience. It is only through interaction with individuals in the environment (in this case business) under study, that accurate and

ontologically sound explanations for their behaviour can be advanced. Quantitative research methods have therefore been used as a means of identifying areas which may benefit from additional investigation and most especially phenomenological examination. This study has therefore attempted to set an agenda which researchers active in this field may choose to follow. In no way do the results derived lay claim to presenting all the solutions, instead a number of findings which may prove to be fruitful sources for those looking to advance the network - business co-operation further are advanced.

5.3 Research Aim and Hypotheses

As has been identified through a review of the existing literature as presented in the preceding chapters, network research has concentrated for the most part in theoretical discussion of co-operative issues. Little use has been made of empirical study, and where such studies have been conducted their conclusions can rarely be applied outside of the original sample. The principal aim of this research then is to fill this gap.

More specifically the research programme outlined will examine the affect of a number of antecedents to co-operation, and their effect on a firms network propensity and behaviour. This overall aim can be broken down into a number of hypotheses:

H1: Co-operative propensity is affected by an owner-manager's personality.

H2: Co-operative propensity is affected by the owner-manager's previous experience of participating in co-operative relationships.

H3: Co-operative propensity is affected by the owner-manager's membership with regards to business related groups.

H4: Co-operative propensity is affected by the owner-manager's demographic characteristics.

H5: Co-operative propensity is affected by the firm's demographic characteristics.

H6: An owner-manager's personality will influence their perception of network success.

H7: The performance of a owner-manager's business will influence their perception of network success.

H8: The level of trust which exists between participants will influence owner-manager's perception of network success.

H9: The level of commitment which exists between participants will influence owner-manager's perception of network success.

H10: Interpersonal relationship factors which exist between participants will influence owner-manager's perception of network success.

Empirical research data was collected using two standardised postal questionnaires. The first survey collected data which was used to test hypotheses one through to five, whilst the second survey collected data relating to hypotheses six through to ten. The next section of this chapter is used to outline the content of the first questionnaire and the sample frame

used in collecting data from it.

5.4 Phase One - Owner Manager Personality and Co-operative Propensity

As has been stated above the principal aim of this research was the examination of antecedents to SME co-operation and their effects on network propensity and perceptions of success. In the first phase of the research emphasis was placed on the examination of antecedents to network propensity. By investigating owner manager (OM) personality in conjunction with their co-operative activities it was expected that data could be collected that would enable sampled OMs to be classified into groups which would reflect their personality traits and co-operative propensity and the correlation between them. By identifying a relationship in this way, it was hoped that results gained from the survey could be used to predict OMs co-operative propensity outside of the sampled population, thereby increasing the validity of a relatively small survey that might otherwise only be useful at the indicative level.

The research instrument used therefore had to be capable of collecting valid results in two fields - psychology (OM personality) and business management (co-operative propensity and activity). OM personality as has been outlined in detail in Chapter Four is itself a minefield strewn with poor methodology, small and inappropriate samples (Brockhaus, 1980a), questionable validity, etc. Any meaningful instrument would therefore need to be developed from scratch. Adaptation of an existing test was not seen as a feasible option. Given the body of literature that would need to be read prior to development, and the time available for project completion, only two realistic options were available, either to reject this research direction, and any attempt to investigate co-operative antecedents, or to utilise a new instrument which had been developed elsewhere. The latter option was chosen, and

although it was recognised that this was inherently risky and might fail if the chosen instrument were insufficiently sensitive or ineffective in investigating the necessary dimensions, it was felt that the shift in field direction and empirical reorientation that it might precipitate sufficiently outweighed this risk.

The researcher was aided at this time by a fortuitous meeting at a research conference. A presentation was given on an on-going research project which was being conducted by Durham Business School. Researchers at Durham were in the final stages of developing and validating a questionnaire designed to investigate entrepreneurial personality with a view to distinguishing between the successful and unsuccessful entrepreneur and their training needs (Johnson & Ma, 1994; 1995). Their research built on the earlier research of Caird (1989a, 1989b,1993) who had developed the General Enterprising Tendency test whilst she herself was based at Durham. Although her research has been well received and published in the past, it has faced a number of criticisms relating to '*face validity and reliability*' (Johnson & Ma, 1995: 81) and was therefore in need of improvement. A decision was made then to await the completion of the new Durham Business School test (hereafter referred to as the Durham Business School Personality Instrument (DBSPI)). Permission was granted for its use in return for access to results obtained by the researcher, which would then be used by Durham as a means of testing instrument validity.

Initial validation by Durham's researchers was conducted by administering the DBSPI to individuals who had attended or were in the process of attending either an Enterprise Allowance or New Business Scheme organised by Leicestershire's Training and Enterprise Council. One hundred questionnaires were distributed, fifty to respondents who were still in business and fifty by respondents who were no longer in business (Johnson & Ma, 1995). Respondent owner managers were to be found in a number of diverse business

sectors including agriculture, manufacturing, construction, transport and banking and finance services.

Several methodological issues relating to the validation of the test are worth raising here. Firstly, to measure business success only in terms of whether the respondent is currently running a business is to take an excessively simplistic view. There are a number of environmental factors at play which provide alternative reasons for which the OM may no longer be in business e.g. alternative and more lucrative employment elsewhere (in which case the individual might be considered as being more successful than many of the OMs still operating a business); family crisis which demands a less demanding workload than that which is normally enjoyed in self-employment, etc. Secondly, this success measure (still running the business versus no longer running the business) does not recognise the fact that many OMs have quite different reasons for choosing self-employment from the financial motives that people often associate with such a decision. Many OMs operate their business simply as a means of achieving autonomous subsistence, with many, according to Gray (1992), being characterised by a stubborn sense of individualism, rather than a real desire for firm growth.

Notwithstanding these methodological issues, the DBSPI identifies significant differences (where p. < 5%) between the two groups for seven of the tests nine dimensions, these being: need for autonomy (own way); need for achievement; creativity and innovation, locus of control, vision and calculated risk-taking (strategy). If one uses mean scores as a method for evaluating their work here, it is possible to conclude from their study, that respondents who are still in business: exercise a higher need for autonomy as expressed in terms of their need for their own way; display a higher need for achievement; demonstrate higher levels of creativity; possess a more internal locus of control; have greater vision, and

are more likely to formulate a calculated risk-taking strategy than their counterparts who are no longer in business.

Upon receipt the DBSPI was pre-tested on individuals / owner managers (N=22) who were well known to the researcher, an approach which Kolar, *et* al (1996) have shown to be acceptable through their studies in main stream psychology. Pre-test participants were asked to complete the questionnaire, upon completion they were then asked to assign themselves a score between six and twenty four for each of the nine dimensions, this score they were told should reflect the extent to which they believed their personality and the dimension description were congruent. Scores were also assigned by the researcher. The three scores (test determined, participant assigned and researcher assigned) for each individual were then examined for similarity. Correlation (not statistically determined) between test and participant scores were relatively high, correlation between researcher assigned scores and test and participant scores less so, perhaps suggesting the researcher did not know the pre-test participants as well as was initially believed. Results from the pre-test were felt to be satisfactory, and the decision was made to incorporate the test in the first phase questionnaire to which the researcher was at this time putting the finishing touches.

Semi-structured interviews with local OMs (N=12) and network brokers (N=4) were used to test question feasibility, the appropriateness of key terminology and as a means of collecting suggestions for additional questions / question responses which interviewees felt were necessary. The most important issue that was identified through these interviews was the multitude of interpretations and definitions that could be applied to the term 'networking' with each respondent holding a different and quite separate opinion as to its meaning. The scope for encoding - decoding difficulties (Kotler, 1991) was therefore

enormous, the net result of this interpretational ambiguity would be poor result validity, should the questionnaire produce any meaningful results at all. For this reason then the term 'networking' was discarded in favour of 'co-operation' which interviewees found more acceptable, and which provided less scope for pluralistic interpretation.

The completed pilot questionnaire was then mailed to randomly selected owner managers based in either Devon or Cornwall.

Unless the respondent had completed the optional address section on the questionnaire (which was only completed if the recipient wished to receive a copy of their personality test results) their reply was an anonymous one. Although anonymity has been shown by a number of researchers (e.g. McDaniel & Rao, 1986) to have no significant effect on response rate, the decision to allow respondents to be anonymous was made in recognition of the sensitivityof the personality information being collected. Respondents it was felt would be more honest in their answers if they were anonymous, than they would be if they were not given this option. This argument would appear to be supported by a study conducted by Futrel and Swan (1979), in which anonymous respondents were found to display a lower rate of item omission when compared with a non-anonymous control group.

Telephone follow up calls were made to all recipients who were not known to have replied (i.e. individuals who had not either replied in writing stating why they would not be returning the questionnaire, or who had not completed address details as part of the questionnaire) within two weeks of receiving the questionnaire.

Table 5.1 Pilot Response Rate

Total number of Questionnaires sent	40
Returned by Post Office	0
Respondent returned - no longer in business	0
Respondent returned - blank	0
Directory enquiries - no longer in business	0
Adjusted Distribution Total	40
Total Useable Returns - Count	9
Total Useable Returns - Percentage	**22.50%**

No changes were made to the questionnaire in the light of pilot results, although telephone follow up calls revealed that a significant proportion of questionnaires sent had not reached their intended destination, as they had been intercepted by OMs secretaries or personal assistants in their capacity as gatekeepers (Webster & Wind, 1972). An attempt was made to rectify this problem by marking all envelopes included in the main survey with a Private and Confidential stamp. In addition the questionnaire was copied onto coloured paper to aid respondent recall when or if they were contacted / reminded by telephone at a later date. One issue that was repeatedly raised by individuals who had not responded to the pilot was the sheer number of questionnaires they received from both commercial and public sector agencies, the finite time that they had available, and the limited inclination they had to complete them. An additional benefit of printing the questionnaire on coloured paper was the higher response rate that printing on coloured paper or with coloured inks has been shown to elicit in past studies (for example LaGarce & Kuhn, 1995). Paper colour was also used to code the questionnaire by county, with blue paper for Cornwall and green for Devon. This provided the additional benefit of enabling the researcher to study possible spatial variations in firms co-operative propensity (although it should be noted that observation was never intended as a central part of this thesis).

Every effort was made to keep the questionnaire as short as possible, as it was recognised that longer questionnaires almost invariably result in lower response rates. Binner and

Kidd (1994) in their study of the interactive effects of questionnaire length and monetary incentives, found that even when recipients were offered a monetary incentive for returning the questionnaire, they were still more likely to return a short questionnaire (response rate of 54 percent) than a long one (response rate of forty five percent).

Further attempts were made at heightening response rates by hand writing delivery envelopes and hand signing covering letters. The case for survey and envelope personalisation is far from proven, a number of studies and polemics have been offered in support of both sides of the argument (e.g. Wunder & Wyn (1988) find no statistical differences between the two groups, whilst Kanuk and Berenson (1975) in their review of nine studies find that personalisation generated a slightly higher response rate). Although it was felt that personalisation may be perceived as a less professional approach in the eyes of sample members (as is argued by Neider & Sugrue, 1983), it afforded two key benefits when compared with the alternatives. Firstly, it was less likely to be mistaken for a mailshot or any other communication with a commercial agenda, and secondly the added effort required in completing envelopes and letters in this way would it was believed communicate the researchers commitment to the project and interest in its outcomes, with greater conviction and sincerity than could be achieved in the letter alone.

The survey was sent out in equal numbers to randomly selected firms based in Devon (N=250) and Cornwall (N=250). Two weeks after distribution, when it was judged that most willing individuals would already have responded, telephone follow up calls were conducted. Equal numbers of firms from both Cornwall and Devon were contacted, so as not to skew results in favour of one county or the other (a total of 186 firms were contacted in this way). Recipients were asked if they had returned the questionnaire, if they had they were thanked for their assistance, and if not were asked if they would be kind enough to

return it. The usefulness of the results to both the researcher and the firm was stressed. If the individual contacted was prepared to complete the questionnaire, but had thrown away, misplaced or not received the first questionnaire, their address details were confirmed, and a further copy of the questionnaire was dispatched to them. Telephone follow ups ceased to be effective approximately three weeks later, when sample firms were no longer able to remember or find the questionnaire. At this point a new copy of the questionnaire (on white paper) was sent out to those firms that had not sent back a traceable reply (A questionnaire was traceable if the respondent had completed the address section on the questionnaire, thereby stating that they wished to receive a copy of their personality results when these had been calculated), or had not been contacted in the preceding weeks by telephone. The follow up questionnaire was accompanied by a revised covering letter which stressed the good response to date, the interesting results, and the importance of and need for responses from smaller firms. Help-the-sponsor appeals of this type have been shown by Schneider and Johnson (1995) to be an effective means of stimulating a high response when sampling business professionals, a group which is congruent with owner-managers the group of principal interest here. Although a help-the-sponsor appeal proved the most effective approach for both the commercial and university sponsored samples, the response rate from the university sponsored sample proved to be significantly higher, thereby suggesting that this method of appeal is particularly effective when used by university based researchers.

The final number of responses received was 157 out of an adjusted distribution total of 435, this represented a response rate of over thirty six percent (see Table 5.2 for a breakdown of this figure). The distribution total was adjusted for questionnaires returned by the Post Office because the recipient firm had ceased to exist or moved away; questionnaires returned by respondents whose firm had gone into liquidation or folded

voluntarily; questionnaires returned by the recipient incomplete (blank) or firms who were sent a questionnaire but which were subsequently found through telephone calls to directory enquiries, to have ceased trading.

Table 5.2 Response Rate for Devon & Cornwall (Dun and Bradstreet based) Dataset

	Questionnaire Numbers
Total number of questionnaires sent	500
Returned by Post Office	28
Respondent returned - no longer in business	2
Respondent returned - incomplete (blank)	3
Directory Enquiries - no longer in business	32
Adjusted Distribution Total	435
Total Useable Returns - Count	157
Total Useable Returns - Percent	**36.09%**

5.4.1 BEMA Data

The second data set used was a census of members (N=538) of the Bristol Engineering Manufacturers Association (hereafter referred to as BEMA). By collecting data from BEMA members it was possible to achieve two objectives, the first an increase in overall respondent numbers for the first phase of the research programme which it was felt was necessary if results were to be viewed as academically credible and worthy of publication at a later date (clearly results will be viewed as carrying greater validity *ceterus paribus* if the sample is large). The second objective was a test of the hypothesis that members and non-members of a trade association display different co-operative propensities.

Although BEMA was initially founded to serve Bristol, in the sixty years that it has been operating it has expanded its operations considerably, with members now to be found in all of the South West counties, although Avon is still understandably the dominant county.

A similar approach was taken in surveying BEMA members. The only modification made to the questionnaire was the inclusion of an extra question asking respondents to identify the county in which their firm was located. This modification was necessary, as the number of counties in which members were located was too high to permit continued use of the coloured paper coding system.

The response rate for the BEMA sample is given below in Table 5.3. As is clear from Table 5.2 and 5.3 the useable response rate for the Dun and Bradstreet based questionnaire was substantially higher (nearly eight percent) than that recorded for the BEMA membership census. Although reasons for this variance are largely speculative, it is probable that the following two arguments possess some creditability. Firstly, the BEMA sample were and are frequently (in excess of four times a year) asked to complete surveys by the association's administration. Endorsement of the researchers survey may therefore have had a limited effect, given the number of requests BEMA members receive (from both internal and external sources) for the completion of questionnaires within any given year. Secondly, follow up calls for the BEMA sample were conducted on a much smaller scale, and were of limited effectiveness when compared with the Dun and Bradstreet based sample.

Table 5.3 Response Rate for the BEMA Dataset

	Questionnaire Numbers
Total number of questionnaires sent	538
Returned by Post Office	4
Respondent returned - no longer in bus. / member	2
Respondent returned - incomplete (blank)	1
Adjusted Distribution Total	531
Total Useable Returns - Count	150
Total Useable Returns - Percent	28.25%

5.4.2 The Durham Business School Personality Instrument

As outlined above, the theory behind the inclusion of the Durham Business School Personality Instrument (DBSPI) in the first questionnaire was really very simply. Past research has failed to consider the antecedents to, and causal factors responsible for, variations in SME owner-managers (OMs) co-operative propensity and behaviour. Research outlined here is a first attempt at filling this gap. It was argued that OM personality, particularly in micro-businesses where business strategy is frequently a function of OM attitudes, was an obvious place to start such an investigation. Although it is recognised that personality trait theory has received considerable acceptance within the psychology field, it has been the source of prolonged and understandable attack within the business arena. This resistance can be traced back in most instances to one of two sources: a resistance on the part of many business academics to accept any new theory (especially where it contravenes their own established approach) or the proliferation of convenient but often unsuitable research methods by the best known advocates of trait theory (Brockhaus, 1980a).

It was therefore felt that although there were significant obstacles to the acceptance of such an approach, its use, especially in the network field represented a significant methodological breakthrough. The problem then became one of test identification. Although a number of accepted tests exist within the psychology field these were rejected on the grounds of either excessive length, failure to cover personality traits of interest, too esoteric for use in the business field, too transparent or not validated in any way. The DBSPI offered itself as an apparent saviour, which in the words of Johnson and Ma (1995: 81) was developed *'In the absence of any other adequate psychometric measure'* and was

developed as *'a new instrument which focuses upon the behaviour of the owner-manager / entrepreneur'*.

Although it was recognised that the instrument had only been validated using a relatively small and imperfect sample (see the discussion in the preceding chapter) it was accepted and used in the absence of superior alternatives. The test was composed of fifty four items which could be grouped as nine separate dimensions each of which were designed to test a specific aspect of entrepreneurial personality: Dimension A: Need for Autonomy (need for own way); Dimension B: Networking (Openness to Advice); Dimension C: Need for Achievement; Dimension D: Creativity and Innovation; Dimension E: Opportunism; Dimension F: Locus of Control; Dimension G: Vision; Dimension H: Attitudes towards risk; Dimension J: Risk taking Strategy.

It was envisaged that individuals who co-operated with their business counterparts might well possess a greater need for autonomy; higher tendency towards 'networking'; an above average need for achievement; lower opportunism scores (it was hypothesised that an actor who displays a high opportunism score will be more concerned with the potential for opportunistic behaviour that co-operation with others provides, than the potential for mutual benefit that it offers); would display an internal as opposed to an external locus of control, and would display a greater sense of vision. Creativity, attitudes towards risk and risk taking strategies were 'unknowns' with variation if it occurred being likely to be two-tailed, no hypotheses were therefore extended for these dimensions, and as a result a more grounded approach was taken in testing these dimensions.

5.4.3 Co-operation; A hydra-conceptualisation

As has been discussed at length above, the questionnaire was developed through interviews with locally based OMs and network brokers. As a result of these interviews it soon became evident that co-operation was multi-faceted, and could therefore be conceptualised in different ways by different people. Although attempts were made to develop a definition that encompassed all of these dimensions, such an attempt was ultimately rejected on the grounds that the number of interviews conducted to develop such a definition had been small, and therefore no guarantees could be made as to its representativeness of the SME population as a whole. In addition if a definition were developed it was felt that it would be likely to create a number of sampling errors where respondents failed to decode the definition in the manner in which it was encoded, or where they rejected the definition offered despite the fact that they may be co-operating at a number of levels which they believed were not considered in the definition offered.

A decision was therefore made to use Question A3 as a filter question which could be used not only to identify co-operators (COs) and non-co-operators (NCOs) but also to identify the parties and areas in which they had or had not co-operated. This evidently presents a further complication when analysing results, as each box within question A3 (e.g. competitor co-operation <u>in</u> manufacturing) can be considered as representing a separate definition of co-operation. This represents forty five separate definitions, without even considering other areas in which actors can co-operate which are not already included within the question (A3), this problem is compounded when one considers the small numbers that are soon being used for such analysis. Aggregation into co-operative type (e.g. competitor, supplier or customer co-operation) at least in the first instance was felt to be necessary. It was hypothesised that co-operation would vary greatly by co-operative

type. For example it was argued that as almost all firms rely on suppliers for at least some of their product / service inputs, supplier co-operation was therefore viewed as being to all intents and purposes involuntary, and as a result it was argued that it was unlikely that the researcher would identify any meaningful variation between COs and NCOs in terms of their responses to the DBSPI. In contrast it was felt that competitor co-operation was entirely voluntary, and as a result it should be possible to distinguish COs and NCOs with comparative ease. The former argument, it was felt, extended equally to other vertical linkages (distributors and customers), whilst the latter was more appropriate for consultant co-operation.

Survey responses were therefore analysed using SPSS along these lines. Co-operative antecedents were examined for six types of co-operation: general (had the respondent co-operated with anyone); competitor; distributor; consultant; supplier and customer. Hypothesised antecedent variables were then cross-tabulated for each type of co-operation. Pearson's chi-square and Yates correction correlation were used as appropriate. Significant variables were identified and used in the construction of a logistic regression model. These models are discussed in detail along with the statistical methodology which relates to them in the next chapter. Competitor co-operation is used to illustrate in detail the methodological approach taken and the issues that need to be considered when constructing a logistic regression model. Subsequent models are constructed in an identical manner and discussed in a more abbreviated form.

Personality factors were not the only antecedents tested as part of phase one, questions were also asked which sought to examine the affect of the respondents initial motivation for starting / running their business, and their ownership status (owner or manager only). Once again the researcher was interested primarily in the relationship between motivation

and ownership, and the firms co-operative propensity, in order that one might determine for example whether managers are more likely to engage in co-operative activities than their owner-manager counterparts.

Respondents were also asked to indicate whether they were affiliates of key business related groups such as a business club, a Chamber of Commerce, Freemasons' Lodge or trade association. The aim here was to determine whether membership of a business club for example could be used to predict an individual's co-operative propensity. The underlying assumption being that members of business groups are more likely to spend time engaged in voluntary co-operative activities, than their non-member counterparts.

In addition, the first standardised questionnaire was also used to measure the affect of a number of factors on respondents perception of network success. This was intended as a precursor to the more detailed examination of network success which was conducted for specific networks for phase two of the research. To this end questions were included in the survey which examined the level of formality evident in respondents co-operative activities; the amount of time for which co-operative partners were known to respondents before they entered co-operative activities with them; whether the respondent considered co-operation as a solution to short term, medium term or long term needs; respondent characteristics e.g. age and sex; firm characteristics e.g. age of business and number of employees, and personality attributes as measured through use of the DBSPI.

5.5 Phase Two

The second phase of research was centred around the examination of a number of business

related networks, principally business clubs and trade associations, as these groups were identified in the first phase of research as containing firms who displayed higher co-operative propensities. By studying business related organisations in this way the researcher sought to identify key determinants of co-operative success, thereby ascertaining the relative importance of factors such as trust and commitment within these groups.

The significance of trust and commitment, and the need to avoid opportunistic behaviour is implicit in the prisoner's dilemma game theory model presented in Chapter Two. Actors who co-operate stand to gain from a higher pay-off (in the long run- super game scenario) than those who choose to defect. By trusting the other party or parties involved, and by committing to the agreement higher gains can be expected. Opportunistic behaviour, although producing a short-term gain is shown to be counter productive in the long-term.

Although a number of researchers have posited the importance of trust and commitment in relationships at the theoretical level, Morgan and Hunt (1994) are the only academics to test their value empirically. In their paper they argued that trust and commitment were key mediating variables in the relationship marketing process. Having developed their model they tested it using 204 responses (response rate of 14.6%) to a questionnaire administered to automobile tyre retailers. This sample frame was chosen as it was felt that the population was relatively homogeneous, so variation attributable to extraneous sources should be minimised (*Ibid:* 27). Following analyses of the data they concluded that trust and commitment were indeed key mediating variables.

The second phase of this research takes the variables advanced by Hunt and Morgan (1994) in their model as its starting point, many of the items included in the questionnaire administered in the second phase of this research owe at least the germ of the idea for their

inclusion to this model. The second phase questionnaire also seeks to address the limitations that Hunt and Morgan identified in their own model. Firstly by repeating the investigation albeit with a different questionnaire it will be possible to determine whether trust and commitment really are important, or whether the results presented were simply a freak occurrence. Secondly, by drawing the sample from a heterogeneous population which was comprised of individuals from a number of different sectors and industries, and by examining non-supplier linkages as well, it sought to determine how robust the trust – commitment variables really are. If, variation between individuals' responses still exists when 'extraneous sources' (*Ibid:* 27) are included the significance of the two variables may prove to be unequivocal.

Nine networks were researched, these were comprised of three business clubs, three trade associations, two sales and marketing alliances and a public sector managed support group. In all but one of the cases a membership census was conducted. The exception was the Plymouth and District Hotel, Restaurants and Guest Houses Association where there was some duplication of the PPS Hotel and Guesthouse membership. Rather than burden recipients with two questionnaires asking the same questions, but relating to two separate networks / business organisations (thereby possibly risking increased levels of non-response or response error) a decision was made to conduct a census of the smaller group (PPS Hotel and Guesthouse) and remove duplicate members from the Plymouth and District Hotel, Restaurants and Guest Houses Association list before distributing the questionnaire.

Although the number of networks included in this second phase of research was nine, a substantially higher number of organisations were approached with a view to inclusion. Organisations approached in this way included national and regional / local groups.

National: Alliance of Independent Retailers and Businesses; Federation of Small Businesses; Forum of Private Business; National Organisation of Asian Businesses; Printed Circuit Interconnection Federation; Regional: Bath Enterprise Business Club (Bath); The Birmingham Asian Business Association (Birmingham); Bromley Small Business Club (Bromley); Business Connection (Harrow); Canterbury Business Club (Canterbury); Croyden Small Business Club (Croyden); East Devon Business Luncheon Club (Honiton); The Executive Alliance (Halifax); Exeter Small Business Club (Exeter); Great Western Enterprise Business Club (Devizes); Gwent Business Forum (Cwmbran); Hillington Small Business Club (Ruislip); Islington Small Business Club (Islington); Jackson's Business Club (Wimbledon); M4 Innovation Network (Oxford); Mid Wales Manufacturing Group (Newton Powys); New Business Club (Swansea); North American Business Club (Nailsea); North East EMC Club (Sunderland); North London Chamber of Commerce (Palmers Green); North London Enterprise Club (New Barnet); North Wiltshire Business Club (Chippenham); Plymouth Enterprise Group (Plymouth); Small Business Network (Horsham); Solihull Business Club (Solihull); South Devon Business Club (Newton Abbot); Swindon Chamber of Commerce (Swindon); Taunton Business Club (Taunton); Women in Enterprise (Cardiff) and the Women's Forum for the Valley (Merthyr Tydfil).

Although nearly all of the networks approached fit into the low intensity - low formality cell as outlined in Figure 2.1 an attempt was made at achieving diversity within this group. By approaching networks whose membership was comprised of women (Women in Business; Women in Enterprise; Women's Forum for the Valley) or individuals from the ethnic minorities (The National Organisation of Asian Businesses; The Birmingham Asian Business Association) the researcher was looking to test the possibility of relationship between perceptions of success and the respondents race or sex. Unfortunately the researcher was only able to test the relationship for differences between the sexes, as the

ethnic minority networks contacted either failed to respond or did not wish to participate in the research.

Reasons given for non-participating in the research varied from 'not appropriate at this time' through to 'we already have a number of demands on our members time and can therefore not permit the use of a questionnaire by a university'. Another institution which proved to be a significant determinant of co-operative propensity in the first stage of this research programme was the Freemasons. It seemed appropriate then that the Freemasons were approached along with the other groups detailed above. In reply to the letter sent the Grand Secretary (Commander M. B. S. Higham) of the freemasons sent a letter back to the researcher stressing that the researcher along with many other non-members had completely misunderstood the objectives of the organisation, and as a result freemason participation in a research project where the principal source of interest was co-operation was inappropriate (a full copy of the letter can be found in Appendix IV).

Short outlines detailing organisational objectives, membership, history and response rate for the survey are provided for each of the networks in Appendix IV. These outlines were developed through use of the Business Clubs UK Directory for 1995, personal interviews with the organisations chief executives and internal documents produced by the organisations concerned.

Table 5.4 Phase Two - Consolidated Response Rate

	Questionnaire Numbers
Total number of questionnaires sent	721
Returned by Post Office	0
Respondent returned - no longer in business	2
Respondent returned - incomplete (blank)	0
Adjusted Distribution Total	719
Total Useable Returns - Count	245
Total Useable Returns - Percent	34.08%

5.6 Summary

This chapter has sought to outline the methodology used within this research, and more specifically has discussed in some detail the population studied, the sampling frame used and the methods employed in collecting data for both phase one and phase two of the research. In addition it has drawn attention to some of the unusual difficulties that a researcher conducting empirical work in the networking field is likely to encounter. In particular it has sought to demonstrate the inappropriateness of a monomorphous definition, and extends instead a polymorphous definition for testing within the research programme. For ease of classification, and as a means of maximising result validity this definition was aggregated into six bands: Co-operation (an absolute measure of co-operative propensity, either the respondent has or has not co-operated with any party); competitor co-operation; distributor co-operation; customer co-operation; supplier co-operation and distributor co-operation.

Factors affecting the researcher's choice of personality research instrument were also discussed, along with other antecedents to co-operative propensity. The research programme for phase two of the research was also outlined, along with some of the variables that it was believed would be key determinants of an individual's perception of network success.

Chapter Six - The Competitor Co-operation Logistic Regression Model

6.1 Introduction

The following chapter seeks to familiarise the reader with some of the key findings relating to results obtained from analysis of the first standardised postal questionnaire. The analysis presented in this chapter, and Chapter Seven which follows it, centres around the identification of associations between a respondent's co-operative propensity as measured on six bases: General; Competitor; Distributor; Consultant; Supplier and Customer, and key antecedents which are derived from the OM personality; attitudes towards the way in which they run their business, initial motivation for starting the business, membership of business related clubs, propensity to co-operate with other parties and respondent - firm demographics. Each type of co-operation is discussed in turn, and a logistic regression model is advanced as a conceptual tool for the understanding of each. The chapter closes with a summary and discussion of the principal research findings and their implications for current and future network theory and research.

Frequency data relating to the first standardised postal questionnaire can be found in appendices one through to four. Such discussion has been omitted from the results presented here, as it does not directly address the hypotheses extended in the previous chapter. (A full list of tables relating to the random sample, BEMA members and the combined group can be found in Appendices I, II and III respectively. Appendix IV provides a discussion of the most interesting and frequency results).

6.2 Competitor Co-operation

6.2.1 Cross tabulations using Chi-Squared

Chi-squared cross-tabulations were conducted for competitor co-operation against all potential antecedent variables. Antecedent variables are defined here as:

The respondent's motivation for starting the business, it was felt, would be a crucial factor in determining the manner and success with which they ran their business and / or their propensity to co-operate with other parties (as identified in Question A1).

Question A2 was included in the questionnaire as a means of determining whether co-operative propensity increased through membership of various business-oriented groups. Primary interest groups were business clubs, Chambers of Commerce, Freemasons, strategic alliances and trade associations.

D1 - D54 - as discussed at length in the preceding chapter the DBSPI was included as a means of assessing the relevance / importance of OM personality as a determinant of their co-operative propensity and behaviour. It was anticipated that the research would be conducted by examining the data to determine whether relationships existed between the nine dimensions of the DBSPI and a firms co-operative propensity.

This was the theory, but in the words of H. G. Wells (1995: 30):

"Very simple was my [theory], and plausible enough - as most wrong theories are!"

Prior to commencing the analysis, the DBSPI was tested for reliability using the Cronbach Alpha test (an accepted means of evaluating reliability most especially within the psychology field). Unfortunately the results were not as anticipated, and the researcher perhaps due to over reliance on Durham Business School's research reputation, suffered for his naivety in believing that an established and respected business school such as Durham could fail to produce an effective instrument.

A printout of the analysis using Cronbach Alpha, and indicating specific inter-item correlations can be found in Appendix IV. For our purposes here however it is sufficient to say that correlations were poor. Reliability analysis is normally conducted as a means of analysing items so as to identify the most appropriate scale / items for future use. If the item measures consistently, the inter-item correlation should be high. Upon investigation of items within the DBSPI it quickly becomes apparent that this is not the case. Following further examination it is possible to conclude that inter-item correlation's are rarely above 0.5 or 50%. There is no evidence therefore to support the use of any of the dimensions within the DBSPI as they stand.

Respondent - Firm Demographics. A number of demographic questions were also included in the survey, as a means of determining whether OM personality and /or co-operative propensity and behaviour were a function of respondent's age, sex and ethnic origin; or firm: size (as measured by number of employees), age or growth phase (responses comprised of: Start up; survival; growth and maturity).

Although it was recognised that these demographic criteria through their wording were open to misinterpretation (through encoding - decoding difficulties) or may have acted to damage the response rate achieved (e.g. ethnic origin - some individuals refused to answer

or protested about its inclusion) it was made clear that the collection of this information was essential if permission for the use of the DBSPI was to be granted. The question relating to the firm's growth phase is an obvious source of potential misinterpretation (Which stage of growth applies to your firm?). It is not clear whether this question is uni or bi-directional. The stages used are essentially those of an unmodified product life cycle, which would imply that the process is uni-directional, and as such following a period of growth a firm inevitably enters the maturity stage (given sufficient time). It is, far more likely however that respondents interpreted the question at face value, in which case the model could be perceived as being bi-directional. In which case a successful company may well have gone through a period of sustained growth, a period of consolidation (maturity) as a result of changes in the macro-environment, before once again entering the survival stage as it fights for market share and short term profitability. This model in short fails to differentiate between newly emergent firms and established firms that have fallen on hard times. Response rate / full completion levels, it was felt, might suffer as a result of the inclusion of the question relating to ethnic origin. This hypothesis appears to have been supported by the results, with a number of respondents either refusing to answer the question or doubting its relevance.

6.2.2 Chi-Squared - Theory

Fitz-Gibbon & Morris (1986: 99) define chi-square as a test which:

"compares the observed distributions with the distributions that would be expected if there were no relationship between the two sets of categories. (...) The test shows whether the observed distribution is sufficiently different from the expected distribution to be unlikely to have occurred by random sampling."

The test is used here to test the primary hypotheses relating to co-operative antecedents.

The chi-square value can be calculated using the following formula:

$$X^2 = (O-E)^2 / E$$

Where

O is the observed frequency

and E is the expected frequency

The chi-square value is therefore used to calculate the probability of the observed frequencies being a function of random sampling, as opposed to a correlation between the variables being studied. The lower the figure obtained the greater the likelihood of a genuine relationship between the variables being modelled. In the past chi-square calculations have been an arduous process. Having calculated the chi-square value (as defined above) researchers have then had to determine its significance by cross referencing the calculated value against the contingency tables degrees of freedom (this figure can be calculated by multiplying the number of rows minus one by the number of columns minus one) with the chi-square value on an appropriate table. The figure obtained is the significance level for the variables modelled. This procedure would then be repeated for every relevant cross-tabulation. More recently this stage of analysis has received considerable assistance from the increased availability and use of computer statistics packages such as SPSS, which make these calculations possible within a matter of minutes rather than days. It is therefore possible to develop one's analysis beyond this level and explore the applicability of more advanced statistical techniques, such as logistic regression which will be discussed in detail later in this chapter.

Results obtained from chi-square analysis will usually be viewed as unreliable or inaccurate where the following simple rules are not applied. Categories detailed within the table should be mutually exclusive, categories detailed within the contingency table should be exhaustive and observations should be independent and expected cell counts not less than five (Fitz-Gibbon & Morris, 1986: 99).

The last rule relating to expected cell frequency counts is less of a problem than it used to be, a point which is acknowledged by Fitz-Gibbon & Morris, 1986: 99):

"Recent work has removed some previous concerns about small expected frequencies. Nevertheless, you would not generally want to make statements about groups of less than 5 or 6 cases."

It is important to note that the chi-square findings detailed here are not being used in themselves as a means of drawing firm conclusions, but are outlined here as a precursor to the construction of a logistic regression model in which insignificant or inappropriate variables will be removed using backward elimination.

Significant cross-tabulations are summarised in Table 6.1 below.

Table 6.1 Significant uni-variate antecedents to competitor co-operation

Variable	Degrees of Freedom	Minimum Expected Frequency	Number of cells with less than 5 entries	Number of Missing observations	Correlation Significance
A1F – Manager/Owner	1	5.394	0	0	.02946
A2A - Business Club	1	10.788	0	0	.00935
A2E - Trade Assoc.	1	26.371	0	0	.05835
Consultant Co-op.	1	23.674	0	0	.00203
Customer Co-op.	1	45.850	0	0	.00067
Distributor Co-op.	1	22.775	0	0	.00196
Supplier Co-op.	1	45.251	0	0	.00014
D1: need own way	3	2.403	1 of 8 (12.5%)	4	.03254
D4: Generate ideas	3	0.904	2 of 8 (25.0%)	5	.08670
D18: think before	2	6.578	0	6	.04668
D28: against opinions	3	0.603	2 of 8 (25.0%)	5	.08032
D29: reject advice	3	1.227	2 of 8 (25.0%)	7	.01360
D35: evaluate risks	3	2.147	2 of 8 (25.0%)	7	.04554
EmployN2	11	1.515	3 of 24 (12.5%)	10	.09236
Member1	4	0.899	3 of 30 (30.0%)	0	.01055
Sex	1	6.364	0	10	.03160

6.2.3 Discussion of preliminary results identified using Chi-square analysis

6.2.3.1 A1F - Manager / Owner by Competitor Co-operation

Respondents who only manage the business they run display a propensity to co-operate with their competitors that is nearly twice that of respondents who are owners as well as managers (55.56% compared with 28.37%) (p.<.0146). It is likely that manager respondents potential for dislocation from the consequences of their actions, encourages them to take more risks than their owner-manager counterparts, who are all too aware of the affect adverse decision making could have on their business and thus their livelihood.

6.2.3.2 A2A - Membership of a Business Club by Competitor Co-operation

Individuals who are members of a business club are nearly twice (50.00%) as likely to co-operate with competitors when compared with respondents who are not business club

members (27.31%) (p. <.0052). Although this figure is in itself intriguing, it is not clear whether individuals who join business clubs start with greater co-operative propensities, or whether their propensity increases through membership.

6.2.3.3 A2E - Membership of a Trade Association by Competitor Co-operation

Trade association members were also more likely to co-operate with their competitors, although the difference between members and non-members here is not as pronounced, with co-operative levels of 33.33% for members and 21.59% for non-members (p.<.0423).

Despite the obvious questions that need to be clarified regarding these findings (Is an individual's propensity to co-operate with his / her competitors heightened through membership? Or are individuals who favour co-operation more likely to become members?), differences between all of the groups outlined above are undeniable. Actors or institutions seeking to foster or stimulate competitor co-operation would therefore be well advised to use these groups as sample frames of owner-managers with above average co-operative propensity (when compared with the business population as a whole). Findings drawn from these samples could then be used to construct a 'best practice model' which could then be utilised to increase inter-firm co-operation and develop closer more effective co-operation where linkages already exist, or establish linkages where they are not already present.

6.2.3.4 Consultant Co-operation by Competitor Co-operation

One thing which is undoubtedly clear from the chi-square results is that interaction exists between co-operative types. A respondent who co-operates with his / her customers is for

example more likely to co-operate with his / her competitors. Types of co-operation should therefore be viewed as antecedents in themselves and therefore treated accordingly. The results outlined below examine and interpret these relationships in greater detail.

Respondents who co-operate with consultants would appear to be more likely to co-operate with their competitors than individuals who do not, the observed frequency is nearly fifty percent (47.87%) greater than the expected value. A similar relationship is true for the converse situation (do not co-operate with either consultants or competitors), although the interactive affects here are not as strong (the observed here is 7.09% greater than the expected frequency). The observed values for both of the remaining cells were significantly below those expected (has co-operated with a consultant, but not with competitors - 20.46% lower; has not co-operated with a consultant, but has co-operated with competitors - 16.58% lower). The null hypothesis of no relationship is therefore rejected and the existence of a relationship between competitor and consultant co-operation is therefore acknowledged ($p.<.0013$).

6.2.3.5 Customer Co-operation by Competitor Co-operation

A similar relationship is evident between competitor and customer co-operation. Again the null hypothesis of no relationship is rejected in recognition of the variation between observed and expected frequency values. For example the observed value for competitor and customer co-operation exceeds the expected frequency by 30.38%, a smaller (13.13%) but equally significant excess is noted for the no co-operation situation (do not co-operate with either competitors or customers). The observed value is below the expected frequency for both the co-operate with competitors but not customers (-30.66%) and the co-operate with customers but not competitor situations (-13.21%). The relationship between

competitor and customer co-operation is clearly significant, as the probability of the observed values occurring by chance is less than five in ten thousand (p. <.0004).

6.2.3.6 Distributor Co-operation by Competitor Co-operation

A significant relationship between competitor and distributor co-operation is also indicated, with the number of respondents co-operating with both competitors and distributors being nearly fifty percent (49.25%) greater than that which would be expected if no relationship existed between the two variables. As has been noted above, similar less pronounced variations exist between the observed and expected values for the other cells in the contingency table. The relationship between competitor and distributor co-operation is easily significant at the one percent level (p.<.0012).

6.2.3.7 Supplier Co-operation by Competitor Co-operation

A relationship can be established for competitor and supplier co-operation, where variations between observed and expected values are once again evident, with the observed value for competitor and supplier co-operation exceeding their expected by nearly thirty five percent (34.78%) (p.<.0001).

It is clear from the above that there is significant interplay between the different types of co-operation. This has notable ramifications for further analysis and data consideration. Although it may be possible to construct models to model co-operative propensity using multivariate analysis, any model that fails to include other co-operative types will be both inaccurate and naive. Given then that co-operative types would appear to represent antecedents in themselves, and they will be included with all other variables which have

been identified here as significant, and will be used in the construction of a logistic regression model which will be discussed in detail later in this chapter.

The relationships between a respondent's propensity to co-operate with his / her competitors and their personality traits is often less straightforward.

6.2.3.8 D1: I have a strong need to do things my own way

Although a relationship evidently exists (this conclusion is supported by the Pearson chi-square significance p.<.0326), it can not be mapped in a linear fashion. A reasonable supposition could be that individuals who co-operate with their competitors are less likely to express a high need for autonomy (scored as a four on the four point scale used to score personality based questions). When this supposition is used the hypothesis is undeniably supported, with observed and expected scores differing significantly for both co-operating (observed score 21.12% less than expected) and non-co-operating (observed score 9.09% more than the expected value) groups.

However, examining the relationship more fully, it becomes less straightforward. A similar relationship between the observed and expected values for respondents scoring a three (moderately so) would be expected if the relationship were a straightforward one, however, in reality the reverse proves to be the case. The observed value (O.) exceeds the expected value (E.) by nearly twenty two (21.76%) percent for co-operators, whilst being 9.29% less for non-co-operators. For respondents scoring a two for this question the relationship reverts back to the one that was anticipated in formulating the hypothesis (i.e. O. > E. for

non-co-operators and E. > O. for co-operators). The situation reverses once again for respondents who scored one for this question.

The implications of this relationship are therefore not easy to fathom. Perhaps the absence of a linear relationship reflects a flaw in the scaling used, with respondents effectively polarising to one extreme or the other. Certainly the wording used in the scaling could represent a source of confusion, as it is unlikely that respondents would have intuitively known the differences between "Moderately So" and "Somewhat", the existence of this terminological ambiguity may therefore have resulted in a disproportionately high response error level for the middle points on the scale. Alternatively a non-linear relationship may exist between respondents need for their own way and their competitor co-operative propensity, a relationship which is too complex for the analysis conducted here, but which should be the source of more specifically targeted future research.

6.2.3.9 D4: I am able to generate lots of ideas when I need to

Respondent's creativity and their relative Competitor Co-operative Propensity (CCP) correlate at the ten percent level (p.<.0867). This correlation is supported by a further manual analysis of the observed and expected values for each response cell. Individuals who had not co-operated with their competitors believed themselves to be less capable of generating ideas when they needed to. In contrast respondents who had co-operated with their competitors perceived themselves as being capable of producing ideas as required.

This would appear to suggest that owner-managers with high creativity levels are more likely to consider co-operation as a means of conducting their business than their counterparts who possess poorer powers of creativity, or that co-operation has the effect of

increasing creativity amongst its users. It should be noted however that twenty-five percent of the cells in this contingency table had a expected frequency of less than five, and consequently the results should be viewed with caution (Alreck & Settle, 1985). Where this situation occurs researchers frequently recode the variables so as to reduce the degrees of freedom and increase the cells minimum expected frequency values above five. Recoding of this type is however inappropriate and undesirable here, as one of the variables (competitor co-operation) can not be reduced below its current level as it is dichotomous and the other variable (idea generation) is a measure of the respondents' attitudes and through its design seeks to categorise individuals on the basis of their sensitivity to a given statement, this case their capacity to generate ideas. Further agglomeration of their attitudes will therefore result in excessive aggregation of the very factors one is seeking to measure. Therefore results pertaining to respondents' attitudes (for this relationship and those that follow) have not been recoded. Users of the results should however be mindful of the relationships minimum expected frequency levels, and should exercise caution when using results where the minimum expected frequency level is less than five for more than twenty percent of the cells.

Although replication of this study with a larger sample may rectify this problem, it may be that attitudinal differences between respondents who co-operate and those that do not is so pronounced, that even with a larger sample one may be struggling to achieve the crucial twenty percent threshold for some of the associations. The test then becomes something of a victim of its own success. To summarise then, results relating to contingency tables where the cell frequency is less than five for more than twenty percent of cells should not be rejected, but should instead be used with caution, and should not represent the central hypothesis or argument, without considerable support; empirical or theoretical, from elsewhere.

6.2.3.10 D18: If there is a risk involved in a decision or course of action which affects my business I will think it through thoroughly

Individuals who co-operate with their competitors consider the risks involved in their actions carefully before acting (p. <.0467). They consider the options carefully but not too carefully. Respondents were observed to score "Moderately So" more frequently than would have been the case if there were no relationship between their decision making and CCP, and "Not at all" , "Somewhat" and "Very much so" more frequently. The reverse was the case for non-co-operating respondents for all but the "Not at all" response for which a zero frequency was recorded for both co-operating and non-co-operating respondents.

These results would appear to suggest that individuals who do not consider a decision thoroughly will shy away from co-operating with their competitors, perhaps considering it so inherently risky that it does not even merit consideration, whilst those actors who consider the risks very carefully before acting may reach the same conclusion through a more thorough decision-making process, or may miss the co-operative boat through indecision.

6.2.3.11 D28: I am willing and able to go against the views and opinions of others in order to do what I believe is necessary for my business

Once more a statistically significant relationship is identified by the SPSS computer package (p. < .0804), but upon further analysis, as with question D1 it is difficult to determine exactly what this relationship is, and the substantive significance of it.

All the observed frequency levels differ substantially when compared with their individual expected frequency values, and although there is a clear pattern within this observed deviation it is difficult to determine its ramifications. Looking to the scales' extremes, it would appear that actors who are willing to go against the opinions of others are more likely to co-operate than their non-co-operating counterparts. However further examination of the data relating to respondents who indicated a "Moderately So" or "Somewhat" reply to question D28 throws doubt over this conclusion. If this conclusion were valid we would expect to find the number of co-operating actors indicating "Somewhat" would be above that expected, and the number scoring "Moderately So" would be higher than anticipated (and vice versa for non-co-operators). In reality the opposite is true, forcing one to conclude that the relationship is either more complex than such a simple conclusion would suggest, or that the "correlation" that emerges is nothing more than a statistic produced by chance, albeit a chance that one would only ordinarily expect to emerge only nine times in a hundred.

6.2.3.12 D29: I tend to reject the advice and guidance of others

Respondents who co-operate with their competitors are more likely to reject advice and guidance offered by others, than their non-co-operating counterparts (p. <.0137). Two possible explanations for this outcome present themselves. Either actors who co-operate with their competitors are less concerned with the risks involved in such an arrangement, and are therefore more prepared to reject cautionary counsel offered by others, or the same individuals have greater confidence and as a result are not prepared to accept a negative outcome.

6.2.3.13 D35: I am able to effectively evaluate the various risks involved in running my business

The co-operating actors' belief in the rightness of their actions posited above is supported here by the existence of a correlation between an individual's CCP and his / her perceived ability to assess risk effectively. As might be expected intuitively respondents who doubt their capacity to effectively determine risk are less likely to co-operate with their competitors, whilst the reverse is true for respondents who express a greater belief in their ability to assess risk (p. <.0456).

6.2.3.14 Number of Employees (EmployN2)

Results from the Pearson chi-square test for the employment and competitor co-operation variables indicate a correlation at the ten percent level (p. < .0904). As a rule one finds that larger firms (i.e. those classified as 9 or over) are more likely to co-operate with their competitors. However, there are notable exceptions to this rule. The competitor co-operative propensity (CCP) of micro-firms (classified in the output as 1) exceeded the expected level, however the difference between the observed and expected value is small (only 1 respondent for co-operators and 4 for non-co-operators). No real conclusions can therefore be drawn from this anomaly without repeating the test using a larger sample. Although such a finding does make intuitive sense, as one would expect smaller organisations to utilise all available resources in order to survive and grow, once they have grown they are able to reassert their desire for autonomy (as can be seen for the second group in this classification) before growing to a point (group 3 in this classification) at which growth can no longer be attained through internal resources alone. It should be

stressed that the preceding argument is largely supposition and as has already been stated, is based on very small deviations away from expected values, such an argument may however form the basis of a hypothesis for testing at a later date with a larger sample, or with a sample which is more heavily represented by firms which employ an appropriate number of employees to fit these groups (1 and 3).

The implications for public sector agencies looking to increase business co-operation is clear. If a linear reductionist approach of 'picking winners' is taken (Storey, 1992) one of the key criteria that should be considered is firm size. If this approach is employed, greatest emphasis should therefore be placed on either encouraging larger firms to co-operate more (or more effectively), or on demonstrating the advantages that can be derived from co-operation to OMs of smaller non-micro firms.

6.2.3.15 Respondents' Sex

The relationship between a respondent's CCP and their gender is significant at the five percent level (p. <.0317). Male respondents were found to have a higher CCP than expected, whilst the observed figure for female respondents was lower than expected.

The finding detailed above should however, be considered as preliminary, as female respondents for this study represent only 7.07% of the total. Concrete conclusions should therefore be reserved until such a time as it is possible to test the relationship again using either a larger sample, or a sample in which female owner managers or managers represent a greater proportion of the total.

A comment offered within the questionnaire by a female owner-manager of a retail outlet

would appear to suggest that a difference between the sexes does exist, at least in terms of their general co-operative propensity, and that this difference is forced upon them by men who are seeking to exclude them from their networks:

"For the 25 years that I have been in business I have been a woman in a man's world and this has denied me <u>MANY</u> co-operative opportunities."

The *prima facia* evidence detailed above coupled with the work of Smuller (1990) and Smelter and Fann (1989) in her study of sex and ego networks indicates the potential importance of a respondent's sex as a determinant of his / her CCP, and certainly provides sufficient evidence to merit further investigation as part of the in the second phase of this research programme.

6.2.3.16 Member 1

The relationship between CCP and respondents membership of individual business related groups has been examined above. The presence of significant relationships there stimulated the researcher to consider the possibility of a relationship between the total number of groups an individual is a member of and their relative CCP. The two variables were found to be significant at the five percent level ($p.<.0106$). Respondents who co-operate with their competitors are likely to be members of more groups than their counterparts who have not co-operated in this way. Just over forty percent of co-operating respondents are members of two or more groups as compared with nearly twenty three percent for non-co-operators.

Once again any conclusions regarding the direction of this relationship are purely speculative, as it is impossible to be sure (at least from the data summarised in this study)

whether individuals who join a number of groups start with a higher than average CCP, or whether their propensity increases through membership of these groups. The greater number of co-operating individuals within these groups makes them an ideal sampling frame for the second phase of this research, where the determinants of network success will be investigated more fully.

6.3 Logistic Regression

Pearson's chi-square has been used in the analysis outlined above to identify the Univariate antecedents to competitor co-operation, and has indeed been successful in identifying a number of relationships which may in themselves be worthy of further consideration or research. However, a single variable can rarely be expected to account for all the variation in any other (in this case competitor co-operation), consequently researchers find it necessary to consider and model their findings using more sophisticated techniques such as multivariate analysis, and it is to this area and more specifically logistic regression that we now turn.

Although a number of multivariate statistical techniques are available, on the grounds of appropriateness discussion will be confined here for the most part to logistic regression (LR). Two of the most commonly used and cited alternatives to LR are multiple regression and discriminant analysis, there are however several reasons for which LR represents a superior tool for use here. Multiple (linear) regression is inappropriate in any case where the dependant variable is categorically defined and has only two values, (as it is here - actors who co-operate with their competitors and actors who do not), as it assumes the data

is continuous and tends therefore to make predictions in decimal terms which are clearly meaningless where the dependent variable is dichotomous (Gilbert, 1993). Multiple linear regression is equally unsuitable for conditions in which the model produced is required to predict future values (Norusis, 1992), multiple linear regression is therefore for the aforementioned reasons rejected here. Discriminant analysis is also inappropriate. Despite being able to function with a dichotomous dependent variable and predict future values, the dataset summarised here fails to meet two criteria identified by Norusis (1992) which are essential if output is to be seen as reliable. In constructing a model, discriminant analysis assumes that the independent variables satisfy multivariate normality, and that the variance-covariance matrices for the two groups are equal as is required if optimal predictivity is to be achieved (Norusis, 1992: 1). Neither of these criteria can be satisfied using the current data set.

Logistic regression is therefore adopted here, as it enables the use of dichotomous categorical data, and makes fewer demands of that data in terms of normality and distribution.

The probability of an event occurring, in this case a respondent co-operating with their competitors can therefore be modelled using the following formula:

$$\text{Prob (event)} = 1 / 1 + e^{-Z}$$

where $Z = B_0 + B_1 X_1 + B_2 X_2 + ... + B_p X_p$

Where B_n represents the coefficient(s) calculated from the data, X is the independent variable(s) and e is the base of the natural logarithms, approximately 2.718 (Norusis, 1992:

2).

The probability of an event not happening then; in this case a respondent not co-operating with their competitors is simply:

Prob (no event) = 1 - Prob (event)

As the sample used is not large, hypotheses will be tested using a statistical test based on the change in the log likelihood, rather than the more commonly cited Wald statistic whose accuracy has been questioned (Hauck & Donner, 1977) for use on comparatively small samples.

Dichotomous variables can be used within logistic regression without adaptation, although the computer will give them internal values of either zero or one when making its calculations, irrespective of the values initially recorded for these variables. Categorical data is more problematic however and requires further adaptation before modelling can take place, such adaptation is required if the data is to be interpreted in a meaningful way by the SPSS computer package. Categorical data can be differentiated from continuous data along mathematical lines. There is a clear mathematical relationship between a firm that has a workforce comprising fifty employees and one that consists of a hundred, the latter is precisely twice the former and as a result can be modelled accordingly. No such relationship exists, at least not in mathematical terms, for attitudes measured using a five point Likert scale. One can not say with confidence that a respondent who believes himself / herself to be "highly successful" in running his / her business is twice as effective as an individual who scores himself / herself as only successful. If a meaningful model is to be

constructed these non-mathematical relationships need to be assigned an internal mathematical value. The approach adopted for this data set is the indicator variable coding scheme. By using this method it is possible to produce a number of variables equal to the points on a scale minus one. By way of example Table 6.2 illustrates an example in which a respondent could be either a manager, supervisor or employee the following code might be used.

Table 6.2 Example of the coding system employed in modelling categorical data in logistic regression

Position	Parameter Coding (1)	Parameter Coding (2)
Manager (1)	1	0
Supervisor (2)	0	1
Employee - other (3)	0	0

This coding technique works by relating variables to one another so that the old coding system denoted in brackets in the Position column becomes redundant. A respondent who has indicated he / she is a manager therefore receives a new label of parameter coding 1. Individuals that score a 1 for parameter code 1 are therefore managers, and all those that are not are scored 0. The distinction is therefore reduced to that of managers and non-managers, and supervisors and non-supervisors (parameter code 2). Individuals that are not assigned to either parameter code 1 or parameter code 2 are therefore employees - other.

SPSS is able to compute the categorical covariates which emerge from the coding technique detailed above in a number of different ways. The approach selected for the current data set is the deviation contrast. The deviation contrast works in the following way:

"Each category of the predictor variable except the reference category is compared to the

overall effect" (Norusis, 1992: 27).

The above quote by Norusis (1992) describes the default setting for a deviation contrast, the analysis detailed here uses two alternative reference categories. The first or last category of each variable is used here as a reference point, as opposed to the overall effect which is used by the default. Although in some circumstances specific scores for each variable or sub-variable would not be required, for our purposes it is necessary to have detailed accounts for all potential response categories. The model is therefore run twice, once using the first category deviation approach and once using the last category deviation approach. This necessarily results in some repetition of results, but succeeds in filling the necessary gaps whilst at the same time producing an otherwise identical model.

Having outlined the mathematical principles and methodology used by SPSS when constructing a logistic regression model we can now turn to the results of the model which will be used to explain competitor co-operative propensity more fully.

All of the variables identified as having a significant effect on CCP with Pearson's chi-square were introduced into the model at the second stage, which followed the first in which the constant was calculated. Variables were then removed from the model by using backward LR selection, the method which uses the likelihood-ratio probability and the maximum likelihood estimates for model construction. When using this method a variable is removed from the model when the probability of the log likelihood-ratio exceeds a set level. For the purposes of this study a ten percent significance level was considered acceptable and was therefore taken as the norm.

A number of methods are available for evaluating a model. Models offered as part of this

analysis will be assessed for their quality by using the following indicators: R^2, Goodness of Fit and classification table.

6.3.1 R^2

The R^2 or coefficient of determination statistic is a measure of the substantive significance (strength) of the relationship between the dependent and independent variables. It measures the extent to which the independent variable can be used to explain the variation in the dependent variable. The R^2 statistic is expressed within the numeric range zero to one. A score of zero indicates that the independent variables explains none of the variation in the dependent variable, whilst a score of one indicates that the independent variables are able to do so perfectly (Menard, 1995).

R^2 can be calculated using the following formula (Menard, 1995):

$$R^2 = SSR/SST = (SST-SSE) / SST = 1- (SSE/SST)$$

Where:

$$SSR = \Sigma(Y_j- \overline{Y})^2 - \Sigma-(Y_j- \hat{Y})^2$$

$$SST = \Sigma(Y_j- \overline{Y})^2$$

$$SSE = \Sigma(Y_j- \hat{Y})^2$$

j = independent variable

Y = dependent variable

$\overline{Y}$ = predicted value of Y for all cases

$\hat{Y}$ = the value of Y predicted by the regression equation

It is important to realise that substantive significance is not statistical significance. The former is a measure of the extent to which an independent variable can be used to explain variation in the dependent variable, whilst the later is an expression of the extent to which an observed result can be attributed to relationship association or random sample variation. Menard (1995) notes that it is possible for a relationship in a large sample to be statistically significant but not substantively significant, or in the case of a smaller sample substantively significant but not statistically significant. The need to measure for both substantive and statistical significance is therefore self evident.

6.3.2 Goodness of Fit

The goodness of fit is a measurement of result 'likelihood' for a given set of parameter estimates. The log-likelihood is traditionally multiplied by -2, as this produces a distribution approximating that of chi-square (Menard, 1995). A perfect model is evident where the -2 log-likelihood (-2LL) is zero (Norusis, 1992). Conversely a high -2LL indicates that the model is poor.

The following definition of goodness of fit can be found in Norusis (1992):

$$Z^2 = \sum \frac{\text{Residual}_i^2}{P_i (1 - P_i)}$$

Two additional indicators for goodness of fit are provided by the SPSS computer package.

The 'Model Chi-square', which is simply the difference between the -2LL for the model with only a constant, and that of the model currently being examined. The Model Chi-square works in much the same way as that of the multivariate *F* test in linear regression, it is in essence a test of the null hypothesis, and seeks to determine whether there is a relationship between the independent and dependant variables (in which case the null hypothesis should be rejected (acceptable significance levels vary, the most commonly used are the 10% (0.1), 5% (0.05) and 1% (0.01) levels. A model will be acceptable in this study if the significance is less than or equal to ten percent) or whether no relationship exists (in which case it should be accepted). The 'Improvement' statistic simply measures the extent to which the -2LL has changed since the previous step.

6.3.3 Classification Tables

Perhaps the most appealing measure of model accuracy is the classification table. The classification table is a summary of the level to which the model succeeds in explaining the dependant variable. A four cell matrix is produced which plots the dependant variables possible values (zero or one) for each case (observed) against those that the model would predict if given the values of the independent variables present in the model. SPSS offers three percentages which indicate the extent to which the model succeeds in explaining the dependent variable; one for each of the dependent variable values and a third which is a

statement of the overall percentage of cases that are accurately classified. The percentages are calculated by dividing the figure for the number of cases correctly classified by the total number of cases, multiplying the resulting figure by a hundred and rounding to two decimal places.

A perfect model will classify cases correctly one hundred percent of the time, a poor model is evident where predicted outcomes are accurate for little more than fifty percent of cases. It is important to note that straight probability would provide an individual with a fifty percent chance of guessing correctly without any additional information. A figure which is substantially higher than fifty percent therefore needs to be recorded for accurate classification, if the additional labour entailed in data collection and analysis is to be warranted.

Researchers are commonly more interested in a model's goodness of fit than the accuracy with which it classifies data. Although the two approaches frequently produce similar results it is entirely possible that a model may have a highly significant goodness of fit, whilst at the same time failing to accurately predict and classify the dependent variable for which it was constructed (Menard, 1995).

6.4 The Competitor Co-operative Propensity Logistic Regression Model

As has been already been discussed at some length above the model was constructed using variables identified through analysis using the appropriate chi-square statistic. Variables identified in this way were entered into the model at the first stage and eliminated in subsequent stages (where appropriate) using Backward LR elimination. The variables entered at this first stage and the internal codes allocated to them by the SPSS package are given below in Table 6.3.

Table 6.3: Variables Employed: Competitor Co-operative Propensity Logistic Regression Model 1 (Deviation – Last)

Variable	Description	Internal Code & Label
A2A	Is the respondent a member of a business club ?	0 = Member 1 = Non-member
A2C	Is the respondent a member of a freemason's lodge ?	0 = Member 1 = Non-member
A2E	Is the respondent a member of a trade association ?	0 = Member 1 = Non-member
CO_CONSU	Has the respondent co-operated with consultants ?	0 = Have not co-operated 1 = Have co-operated
CO_CUSTO	Has the respondent co-operated with customers ?	0 = Have not co-operated 1 = Have co-operated
CO_DISTR	Has the respondent co-operated with distributors ?	0 = Have not co-operated 1 = Have co-operated
CO_SUPPL	Has the respondent co-operated with suppliers ?	0 = Have not co-operated 1 = Have co-operated
D1	I have a strong need to do things my own way	1 = Somewhat 2 = Moderately So 3 = Very Much So
D4	Generate ideas when I need to	1 = Somewhat 2 = Moderately So 3 = Very Much So
D18	Think before making decision or taking action	1 = Moderately So 2 = Very Much So
D28	Willing to go against opinions of others	1 = Somewhat 2 = Moderately So 3 = Very Much So
D29	Reject advice and guidance of others	1 = Somewhat 2 = Moderately So 3 = Very Much So
D35	Able to evaluate risks effectively	1 = Somewhat 2 = Moderately So 3 = Very Much So
EMPLOYN2	How many employees does the firm retain ?	1 = 0 - 2.99 Emps. 2 = 3 - 5 Emps. 3 = 6 - 7 Emps. 4 = 8 - 9 Emps. 5 = 10 - 14 Emps. 6 = 15 - 19 Emps. 7 = 20 - 24 Emps. 8 = 25 - 29 Emps. 9 = 30 - 49 Emps. 10 = 50 - 99 Emps. 11 = 100 - 249 Emps. 12 = 250 - 3500 Emps.

MEMBER1	How many groups is the respondent a member of ?	1 = 0 groups 2 = 1 group 3 = 2 groups 4 = 3 groups
SEX	Respondents sex	0 = Male 1 = Female

Although in reality it was necessary to run the model twice in order that all sub-variable scores might be calculated (and indeed results are presented within this chapter for both Models 1 and 2), in the interest of simplicity they will be referred to hereafter as the model.

SPSS analysis ceased at the ninth step as no more variables could be deleted from the model. The following variables were removed from the model on grounds of poor significance or fit: A1F; A2E; CO_CONSU; CO_SUPPL; D1 (1); D1 (2); D1 (3); D4 (1); D4 (2); D4 (3); D28 (1); D28 (2); D28 (3); MEMBER1 (1); MEMBER1 (2); MEMBER1 (3); MEMBER1 (4).

The model's chi-square significance is excellent (p. <0.0000) as a result it can be concluded that the results shown outlined below would be the product of chance on only one occasion in ten thousand. Results for the classification table are also encouraging with the overall percentage for correctly classified data approaching eighty percent (77.14%), a substantial improvement on the results that might have been expected if group membership had been determined using the principles of random probability, where a figure nearer to 50% would be expected. It is important to recognise however, that the model classifies respondents who have not co-operated with their competitors with much greater success (87.11% accurately classified) than individuals who have co-operated in this way (54.65% accurately classified). Users of the model should be mindful of this when using the model.

All variables included in this model are significant at least at the five percent level. Sub-

variables relating to personality traits are however generally not in themselves significant, but are included because of the obvious significance of their parent variables.

By reading off Exponent Beta scores (also referred to in the literature as the odds ratios) it is possible to make comparisons between co-operators and non-co-operators for all of the independent variables. All of the results reported in Table 6.4 relate to co-operating owner managers as opposed to non-co-operating owner managers, results displayed in the model are not however always standardised in this way. Ordinarily scores can be read straight from the model, where this is inappropriate the score needs to be divided into one, thereby producing a score from which the required comparison can be made more easily.

Competitor Co-operative Propensity Logistic Regression Model 1 (Deviation - Last)

-2 Log Likelihood	264.390
Goodness of Fit	263.422

	Chi-Square	df	Significance
Model Chi-Square	88.672	23	.0000
Improvement	-1.573	1	.2098

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for CO_COMPE

		Predicted No N	Predicted Yes Y	Percent Correct
Observed				
No	N	175	23	88.38%
Yes	Y	43	45	51.14%
			Overall	76.92%

---------- Variables in the Equation ----------

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
A2A	-1.3423	.4743	8.0093	1	.0047	-.1305	.2613
CO_DISTR	.9528	.3441	7.6689	1	.0056	.1267	2.5931
CO_CUSTO	.7678	.3236	5.6291	1	.0177	.1014	2.1550
D18			7.3225	2	.0257	.0970	
D18(1)	-.7987	.5199	2.3599	1	.1245	-.0319	.4499
D18(2)	.8001	.3209	6.2177	1	.0126	.1093	2.2257
D29			12.2884	3	.0065	.1335	
D29(1)	2.4182	6.7822	.1271	1	.7214	.0000	11.2256
D29(2)	2.9547	6.7841	.1897	1	.6632	.0000	19.1956
D29(3)	.6597	6.7924	.0094	1	.9226	.0000	1.9343
D35			8.8183	3	.0318	.0893	
D35(1)	-6.3255	14.7182	.1847	1	.6674	.0000	.0018
D35(2)	1.3400	4.9184	.0742	1	.7853	.0000	3.8190
D35(3)	2.1311	4.9107	.1883	1	.6643	.0000	8.4245
SEX	-1.6111	.8367	3.7078	1	.0542	-.0696	.1997
EMPLOYN2			20.3022	11	.0414	.0000	
EMPLOYN2(1)	.5253	.4812	1.1914	1	.2750	.0000	1.6909
EMPLOYN2(2)	-.4153	.4486	.8568	1	.3546	.0000	.6602
EMPLOYN2(3)	1.1085	.5734	3.7364	1	.0532	.0701	3.0297
EMPLOYN2(4)	-.0282	.5371	.0028	1	.9581	.0000	.9722
EMPLOYN2(5)	-1.6330	.5110	10.2120	1	.0014	-.1525	.1953
EMPLOYN2(6)	-.3515	.4936	.5072	1	.4764	.0000	.7036
EMPLOYN2(7)	-.6817	.5706	1.4275	1	.2322	.0000	.5057
EMPLOYN2(8)	-.2853	.5668	.2534	1	.6147	.0000	.7518
EMPLOYN2(9)	.0118	.4507	.0007	1	.9791	.0000	1.0119
EMPLOYN2(10)	.5391	.4239	1.6177	1	.2034	.0000	1.7145
EMPLOYN2(11)	1.1905	.7365	2.6129	1	.1060	.0417	3.2888
Constant	-3.8762	8.4806	.2089	1	.6476		

---------- Model if Term Removed ----------

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
A2A	-136.340	8.291	1	.0040
CO_DISTR	-136.073	7.755	1	.0054
CO_CUSTO	-135.070	5.750	1	.0165
D18	-136.071	7.752	2	.0207
D29	-142.165	19.939	3	.0002
D35	-140.957	17.525	3	.0006
SEX	-134.669	4.949	1	.0261
EMPLOYN2	-144.159	23.928	11	.0130

---------- Variables not in the Equation ----------

Residual Chi Square 15.187 with 17 df Sig = .5820

Variable	Score	df	Sig	R
A1F	.9432	1	.3315	.0000
A2E	.4448	1	.5048	.0000
CO_SUPPL	1.5782	1	.2090	.0000
CO_CONSU	.3125	1	.5761	.0000
D1	3.1870	3	.3637	.0000
D1(1)	1.9451	1	.1631	.0000
D1(2)	.2277	1	.6332	.0000
D1(3)	1.4170	1	.2339	.0000
D4	2.1132	3	.5493	.0000
D4(1)	.5080	1	.4760	.0000
D4(2)	.1430	1	.7053	.0000
D4(3)	1.3619	1	.2432	.0000
D28	2.6644	3	.4463	.0000
D28(1)	1.2055	1	.2722	.0000
D28(2)	.2211	1	.6382	.0000
D28(3)	1.9760	1	.1598	.0000
MEMBER1	4.2630	4	.3716	.0000
MEMBER1(1)	.8267	1	.3632	.0000
MEMBER1(2)	1.6215	1	.2029	.0000
MEMBER1(3)	.9739	1	.3237	.0000
MEMBER1(4)	.0276	1	.8680	.0000

No more variables can be deleted or added.

Table 6.4 below summarises the exponent beta scores or odds ratios relating to the competitor logistic regression model 1, the last stage of which is displayed above.

Table 6.4: Standardised Exponent Beta Scores for Competitor Co-operative Propensity Logistic Regression Model 1 (Deviation – Last)

VARIABLE	STANDARDISED EXPONENT BETA
A2A	3.83
CO_CUSTO	2.59
CO_SUPPL	2.16
D18 (1)	0.45
D18 (2)	2.23
D29 (1)	11.23
D29 (2)	19.20
D29 (3)	1.93
D35 (1)	0.0018
D35 (2)	3.82
D35 (3)	8.42
EMPLOYN2 (1)	1.69
EMPLOYN2 (2)	0.66
EMPLOYN2 (3)	3.03
EMPLOYN2 (4)	0.97
EMPLOYN2 (5)	0.20
EMPLOYN2 (6)	0.70
EMPLOYN2 (7)	0.51
EMPLOYN2 (8)	0.75
EMPLOYN2 (9)	1.01
EMPLOYN2 (10)	1.71
EMPLOYN2 (11)	3.29
SEX	5.01

Table 6.5: Variables Employed: Competitor Co-operative Propensity Logistic Regression Model 2

Variable	Description	Internal Code & Label
A2A	Is the respondent a member of a business club ?	0 = Member 1 = Non-member
A2C	Is the respondent a member of a freemason's lodge ?	0 = Member 1 = Non-member
A2E	Is the respondent a member of a trade association ?	0 = Member 1 = Non-member
CO_CONSU	Has the respondent co-operated with consultants ?	0 = Have not co-operated 1 = Have co-operated
CO_CUSTO	Has the respondent co-operated with customers ?	0 = Have not co-operated 1 = Have co-operated
CO_DISTR	Has the respondent co-operated with distributors ?	0 = Have not co-operated 1 = Have co-operated
CO_SUPPL	Has the respondent co-operated with suppliers ?	0 = Have not co-operated 1 = Have co-operated
D1	I have a strong need to do things my own way	1 = Not at All 2 = Somewhat 3 = Moderately So
D4	Generate ideas when I need to	1 = Not at All 2 = Somewhat 3 = Moderately So
D18	Think before making decision or taking action	1 = Somewhat 2 = Moderately So
D28	Willing to go against opinions of others	1 = Not at All 2 = Somewhat 3 = Moderately So
D29	Reject advice and guidance of others	1 = Not at All 2 = Somewhat 3 = Moderately So
D35	Able to evaluate risks effectively	1 = Not at All 2 = Somewhat 3 = Moderately So
EMPLOYN2	How many employees does the firm retain ?	1 = 3 - 5 Emps. 2 = 6 - 7 Emps. 3 = 8 - 9 Emps. 4 = 10 - 14 Emps. 5 = 15 - 19 Emps. 6 = 20 - 24 Emps. 7 = 25 - 29 Emps. 8 = 30 - 49 Emps. 9 = 50 - 99 Emps. 10 = 100 - 249 Emps. 11 = 250 - 3500 Emps.
MEMBER1	How many groups is the respondent a member	1 = 1 group

	of ?	2 = 2 groups 3 = 3 groups 4 = 4 groups
SEX	Respondent's sex	0 = Male 1 = Female

Competitor Co-operative Propensity Logistic Regression Model 2 (Deviation –First)

Goodness of Fit	263.422		
	Chi-Square	df	Significance
Model Chi-Square	88.672	23	.0000
Improvement	-1.573	1	.2098

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for CO_COMPE

		Predicted N	Predicted Y	Percent Correct
Observed				
No	N	175	23	88.38%
Yes	Y	43	45	51.14%
			Overall	76.92%

---------- Variables in the Equation ----------

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
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CO_DISTR	.9528	.3441	7.6689	1	.0056	.1267	2.5931
CO_CUSTO	.7678	.3236	5.6291	1	.0177	.1014	2.1550
D18			7.3225	2	.0257	.0970	
D18(1)	.8001	.3209	6.2177	1	.0126	.1093	2.2257
D18(2)	-.0014	.3034	.0000	1	.9963	.0000	.9986
D29			12.2884	3	.0065	.1335	
D29(1)	2.9547	6.7841	.1897	1	.6632	.0000	19.1956
D29(2)	.6597	6.7924	.0094	1	.9226	.0000	1.9343
D29(3)	-6.0326	20.3348	.0880	1	.7667	.0000	.0024
D35			8.8183	3	.0318	.0893	
D35(1)	1.3400	4.9184	.0742	1	.7853	.0000	3.8190
D35(2)	2.1311	4.9107	.1883	1	.6643	.0000	8.4245
D35(3)	2.8544	4.9133	.3375	1	.5613	.0000	17.3640
SEX	-1.6111	.8367	3.7078	1	.0542	-.0696	.1997
EMPLOYN2			20.3022	11	.0414	.0000	
EMPLOYN2(1)	-.4153	.4486	.8568	1	.3546	.0000	.6602
EMPLOYN2(2)	1.1085	.5734	3.7364	1	.0532	.0701	3.0297
EMPLOYN2(3)	-.0282	.5371	.0028	1	.9581	.0000	.9722
EMPLOYN2(4)	-1.6330	.5110	10.2120	1	.0014	-.1525	.1953
EMPLOYN2(5)	-.3515	.4936	.5072	1	.4764	.0000	.7036
EMPLOYN2(6)	-.6817	.5706	1.4275	1	.2322	.0000	.5057
EMPLOYN2(7)	-.2853	.5668	.2534	1	.6147	.0000	.7518
EMPLOYN2(8)	.0118	.4507	.0007	1	.9791	.0000	1.0119
EMPLOYN2(9)	.5391	.4239	1.6177	1	.2034	.0000	1.7145
EMPLOYN2(10)	1.1905	.7365	2.6129	1	.1060	.0417	3.2888
EMPLOYN2(11)	.0199	1.0703	.0003	1	.9852	.0000	1.0201
Constant	-3.8762	8.4806	.2089	1	.6476		

---------- Model if Term Removed ----------

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
A2A	-136.340	8.291	1	.0040
CO_DISTR	-136.073	7.755	1	.0054
CO_CUSTO	-135.070	5.750	1	.0165
D18	-136.071	7.752	2	.0207
D29	-142.165	19.939	3	.0002
D35	-140.957	17.525	3	.0006
SEX	-134.669	4.949	1	.0261
EMPLOYN2	-144.159	23.928	11	.0130

---------- Variables not in the Equation ----------

Residual Chi Square 15.187 with 17 df Sig = .5820

Variable	Score	df	Sig	R
A1F	.9432	1	.3315	.0000
A2E	.4448	1	.5048	.0000
CO_SUPPL	1.5782	1	.2090	.0000
CO_CONSU	.3125	1	.5761	.0000
D1	3.1870	3	.3637	.0000
D1(1)	1.2533	1	.2629	.0000
D1(2)	.4826	1	.4872	.0000
D1(3)	1.9451	1	.1631	.0000
D4	2.1132	3	.5493	.0000
D4(1)	.0725	1	.7877	.0000
D4(2)	1.9405	1	.1636	.0000
D4(3)	.5080	1	.4760	.0000
D28	2.6644	3	.4463	.0000
D28(1)	.7076	1	.4002	.0000
D28(2)	2.1508	1	.1425	.0207
D28(3)	1.2055	1	.2722	.0000
MEMBER1	4.2630	4	.3716	.0000
MEMBER1(1)	.1694	1	.6807	.0000
MEMBER1(2)	1.6864	1	.1941	.0000
MEMBER1(3)	.5024	1	.4784	.0000
MEMBER1(4)	.8267	1	.3632	.0000

No more variables can be deleted or added.

Table 6.6: Standardised Exponent Beta Scores for Competitor Logistic Regression Model 2 (Deviation – First)

VARIABLE	STANDARDISED EXPONENT BETA
A2A	3.83
CO_CUSTO	2.59
CO_SUPPL	2.16
D18 (1)	2.23
D18 (2)	1.00
D29 (1)	19.20
D29 (2)	1.93
D29 (3)	0.0024
D35 (1)	3.82
D35 (2)	8.42
D35 (3)	17.36
EMPLOYN2 (1)	0.66
EMPLOYN2 (2)	3.03
EMPLOYN2 (3)	0.97
EMPLOYN2 (4)	0.20
EMPLOYN2 (5)	0.70
EMPLOYN2 (6)	0.51
EMPLOYN2 (7)	0.75
EMPLOYN2 (8)	1.01
EMPLOYN2 (9)	1.71
EMPLOYN2 (10)	3.29
EMPLOYN2 (11)	1.02
SEX	5.01

Upon further investigation of competitor logistic regression models 1, and 2 it becomes evident that there is a substantial imbalance between the model's ability to predict accurately non-co-operating (87.11%) and co-operating (54.65%) respondents. It was felt that this could be attributed to the imbalance in absolute number terms between these categories, and the resultant noise and distortion such an imbalance creates within the model. For this reason the model was re-run using equal numbers of co-operating and non-co-operating responses (cases were chosen at random). The same variables and sub-variables which were entered for model 1 were used for model 3 (a summary is provided in Table 6.3) and for model 4 as were used for model 2 (a summary is provided in Table 6.5), the model ceased calculation at the fourteenth stage.

The resultant model(s) were found to have an improved goodness of fit, identical model chi-square and similar overall classification percentage. Perhaps most importantly however, the difference between Yes - No observed and expected scores was much lower. The result is in short a superior model. It should however be noted that some of the variables deemed significant in models 1 and 2 are not present here, whilst others that were previously found to be insignificant are found to be worthy of inclusion here. This seeming anomaly can be attributed to the noise and distortion evident within models 1 and 2, and as a result results derived from models 1 and 2 should be dismissed on the grounds of poor validity. Models 3 and 4 will therefore be used as the source of all future analysis or discussion.

Competitor Co-operative Propensity Logistic Regression Model 3 (Deviation –Last)

```
-2 Log Likelihood          162.736
 Goodness of Fit           156.138

                    Chi-Square     df Significance

 Model Chi-Square       77.041     22          .0000
 Improvement            -2.421      1          .1197

Note:  A negative Chi-Square value indicates that the Chi-Square
       value has decreased from the previous step.

Classification Table for CO_COMPE
                          Predicted
                        No        Yes      Percent Correct
                        N         Y
                   +---------+---------+
Observed           |         |         |
   No        N     |   65    |   20    |     76.47%
                   +---------+---------+
   Yes       Y     |   18    |   70    |     79.55%
                   +---------+---------+
                              Overall        78.03%

------------------------ Variables in the Equation -------------------------

Variable                B        S.E.      Wald     df       Sig         R    Exp(B)

A2A                -1.9985      .7497    7.1058      1      .0077   -.1459     .1355
CO_CUSTO             .8673      .4314    4.0411      1      .0444    .0923    2.3805
CO_DISTR             .8393      .4551    3.4015      1      .0651    .0765    2.3147
D18                             .        6.6407      2      .0361    .1049
 D18(1)            -1.0357      .6144    2.8418      1      .0918   -.0593     .3550
 D18(2)              .9811      .3924    6.2526      1      .0124    .1332    2.6675
D29                             .       12.8862      3      .0049    .1695
 D29(1)             2.5099    10.4484     .0577      1      .8102    .0000   12.3036
 D29(2)             3.5539    10.4512     .1156      1      .7338    .0000   34.9490
 D29(3)              .9677    10.4551     .0086      1      .9263    .0000    2.6319
D35                             .       11.9200      3      .0077    .1571
 D35(1)            -5.6447    21.7652     .0673      1      .7954    .0000     .0035
 D35(2)              .5264     7.2681     .0052      1      .9423    .0000    1.6928
 D35(3)             2.1579     7.2609     .0883      1      .7663    .0000    8.6525
EMPLOYN2                        .       16.4224     11      .1262    .0000
 EMPLOYN2(1)         .8737      .6426    1.8484      1      .1740    .0000    2.3958
 EMPLOYN2(2)         .2489      .6245     .1588      1      .6902    .0000    1.2826
 EMPLOYN2(3)        1.4751      .7832    3.5470      1      .0597    .0803    4.3714
 EMPLOYN2(4)        -.2542      .6657     .1459      1      .7025    .0000     .7755
 EMPLOYN2(5)       -1.8952      .6569    8.3251      1      .0039   -.1624     .1503
 EMPLOYN2(6)         .1280      .5873     .0475      1      .8275    .0000    1.1365
 EMPLOYN2(7)       -1.0592      .6967    2.3116      1      .1284   -.0360     .3467
 EMPLOYN2(8)        -.1827      .7150     .0653      1      .7983    .0000     .8330
 EMPLOYN2(9)         .9226      .6664    1.9168      1      .1662    .0000    2.5159
 EMPLOYN2(10)        .3951      .5286     .5588      1      .4548    .0000    1.4846
 EMPLOYN2(11)        .3639      .7466     .2375      1      .6260    .0000    1.4389
Constant           -3.7854    12.8095     .0873      1      .7676
```

---------- Model if Term Removed ----------

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
A2A	-85.720	8.705	1	.0032
CO_CUSTO	-83.441	4.146	1	.0417
CO_DISTR	-83.133	3.529	1	.0603
D18	-85.011	7.285	2	.0262
D29	-91.074	19.412	3	.0002
D35	-90.007	17.278	3	.0006
EMPLOYN2	-91.336	19.937	11	.0462

---------- Variables not in the Equation ----------

Residual Chi Square 18.629 with 19 df Sig = .4808

Variable	Score	df	Sig	R
A1F	.5425	1	.4614	.0000
A2C	2.3355	1	.1265	.0374
A2E	.2127	1	.6446	.0000
CO_CONSU	.1166	1	.7328	.0000
CO_SUPPL	.8582	1	.3543	.0000
D1	3.2091	3	.3605	.0000
D1(1)	.1647	1	.6848	.0000
D1(2)	.5837	1	.4449	.0000
D1(3)	.0973	1	.7551	.0000
D4	3.7326	3	.2918	.0000
D4(1)	.5302	1	.4665	.0000
D4(2)	.3654	1	.5455	.0000
D4(3)	1.8203	1	.1773	.0000
D28	4.6911	3	.1959	.0000
D28(1)	3.5896	1	.0581	.0814
D28(2)	1.4576	1	.2273	.0000
D28(3)	3.3967	1	.0653	.0763
MEMBER1	2.5388	4	.6377	.0000
MEMBER1(1)	.0227	1	.8803	.0000
MEMBER1(2)	1.1673	1	.2799	.0000
MEMBER1(3)	2.1072	1	.1466	.0211
MEMBER1(4)	.0232	1	.8790	.0000
SEX	1.8047	1	.1791	.0000

No more variables can be deleted or added.

Competitor Co-operative Propensity Logistic Regression Model 4 (Deviation – First)

-2 Log Likelihood	162.736
Goodness of Fit	156.138

	Chi-Square	df	Significance
Model Chi-Square	77.041	22	.0000
Improvement	-2.421	1	.1197

Note: A negative Chi-Square value indicates that the Chi-Square value has decreased from the previous step.

Classification Table for CO_COMPE

		Predicted N	Predicted Y	Percent Correct
Observed				
No	N	65	20	76.47%
Yes	Y	18	70	79.55%
			Overall	78.03%

---------- Variables in the Equation ----------

Variable	B	S.E.	Wald	df	Sig	R	Exp(B)
A2A	-1.9985	.7497	7.1058	1	.0077	-.1459	.1355
CO_CUSTO	.8673	.4314	4.0411	1	.0444	.0923	2.3805
CO_DISTR	.8393	.4551	3.4015	1	.0651	.0765	2.3147
D18			6.6407	2	.0361	.1049	
D18(1)	.9811	.3924	6.2526	1	.0124	.1332	2.6675
D18(2)	.0545	.3704	.0217	1	.8830	.0000	1.0560
D29			12.8862	3	.0049	.1695	
D29(1)	3.5539	10.4512	.1156	1	.7338	.0000	34.9490
D29(2)	.9677	10.4551	.0086	1	.9263	.0000	2.6319
D29(3)	-7.0315	31.3348	.0504	1	.8224	.0000	.0009
D35			11.9200	3	.0077	.1571	
D35(1)	.5264	7.2681	.0052	1	.9423	.0000	1.6928
D35(2)	2.1579	7.2609	.0883	1	.7663	.0000	8.6525
D35(3)	2.9604	7.2627	.1662	1	.6836	.0000	19.3057
EMPLOYN2			16.4224	11	.1262	.0000	
EMPLOYN2(1)	.2489	.6245	.1588	1	.6902	.0000	1.2826
EMPLOYN2(2)	1.4751	.7832	3.5470	1	.0597	.0803	4.3714
EMPLOYN2(3)	-.2542	.6657	.1459	1	.7025	.0000	.7755
EMPLOYN2(4)	-1.8952	.6569	8.3251	1	.0039	-.1624	.1503
EMPLOYN2(5)	.1280	.5873	.0475	1	.8275	.0000	1.1365
EMPLOYN2(6)	-1.0592	.6967	2.3116	1	.1284	-.0360	.3467
EMPLOYN2(7)	-.1827	.7150	.0653	1	.7983	.0000	.8330
EMPLOYN2(8)	.9226	.6664	1.9168	1	.1662	.0000	2.5159
EMPLOYN2(9)	.3951	.5286	.5588	1	.4548	.0000	1.4846
EMPLOYN2(10)	.3639	.7466	.2375	1	.6260	.0000	1.4389
EMPLOYN2(11)	-1.0158	1.1196	.8233	1	.3642	.0000	.3621
Constant	-3.7854	12.8095	.0873	1	.7676		

---------- Model if Term Removed ----------

Term Removed	Log Likelihood	-2 Log LR	df	Significance of Log LR
A2A	-85.720	8.705	1	.0032
CO_CUSTO	-83.441	4.146	1	.0417
CO_DISTR	-83.133	3.529	1	.0603
D18	-85.011	7.285	2	.0262
D29	-91.074	19.412	3	.0002
D35	-90.007	17.278	3	.0006
EMPLOYN2	-91.336	19.937	11	.0462

---------- Variables not in the Equation ----------

Residual Chi Square 18.629 with 19 df Sig = .4808

Variable	Score	df	Sig	R
A1F	.5425	1	.4614	.0000
A2C	2.3355	1	.1265	.0374
A2E	.2127	1	.6446	.0000
CO_CONSU	.1166	1	.7328	.0000
CO_SUPPL	.8582	1	.3543	.0000
D1	3.2091	3	.3605	.0000
D1(1)	3.0574	1	.0804	.0664
D1(2)	.0170	1	.8963	.0000
D1(3)	.1647	1	.6848	.0000
D4	3.7326	3	.2918	.0000
D4(1)	.0200	1	.8876	.0000
D4(2)	2.7308	1	.0984	.0552
D4(3)	.5302	1	.4665	.0000
D28	4.6911	3	.1959	.0000
D28(1)	.7442	1	.3883	.0000
D28(2)	2.2931	1	.1299	.0350
D28(3)	3.5896	1	.0581	.0814
MEMBER1	2.5388	4	.6377	.0000
MEMBER1(1)	.4091	1	.5224	.0000
MEMBER1(2)	1.4680	1	.2257	.0000
MEMBER1(3)	.0020	1	.9643	.0000
MEMBER1(4)	.0227	1	.8803	.0000
SEX	1.8047	1	.1791	.0000

No more variables can be deleted or added.

Table 6.7: Standardised Exponent Beta Scores for Competitor Logistic Regression Models 3 and 4

	MODEL INTERNAL CODE	STANDARDISED EXPONENT BETA
BUSINESS CLUB MEMBER	A2A	7.38
CO-OPERATE WITH CUSTOMERS	CO_CUSTO	2.38
CO-OPERATE WITH DISTRIBUTORS	CO_DISTR	2.31
D18 - THINK DECISIONS THROUGH		
Somewhat	D18 Model 3 (1)	0.36
Moderately so	D18 Model 3 (2)	2.67
Very much so	D18 Model 4 (2)	1.06
D29 - REJECT ADVICE / GUIDANCE		
Not at all	D29 Model 3 (1)	12.30
Somewhat	D29 Model 3 (2)	34.95
Moderately so	D29 Model 3 (3)	2.63
Very much so	D29 Model 4 (3)	0.0009
D35 - EFFECTIVELY EVALUATE RISKS		
Not at all	D35 Model 3 (1)	0.0035
Somewhat	D35 Model 3 (2)	1.69
Moderately so	D35 Model 3 (3)	8.65
Very much so	D35 Model 4 (3)	19.31
NUMBER OF EMPLOYEES		
1 = 0 - 2.99 Emps.	EMPLOYN2 Model 3 (1)	2.40
2 = 3 - 5 Emps.	EMPLOYN2 Model 3 (2)	1.28
3 = 6 - 7 Emps.	EMPLOYN2 Model 3 (3)	4.37
4 = 8 - 9 Emps.	EMPLOYN2 Model 3 (4)	0.78
5 = 10 - 14 Emps.	EMPLOYN2 Model 3 (5)	0.15
6 = 15 - 19 Emps.	EMPLOYN2 Model 3 (6)	1.14
7 = 20 - 24 Emps.	EMPLOYN2 Model 3 (7)	0.35
8 = 25 - 29 Emps.	EMPLOYN2 Model 3 (8)	0.83
9 = 30 - 49 Emps.	EMPLOYN2 Model 3 (9)	2.52

10 = 50 - 99 Emps.	EMPLOYN2 Model 3 (10)	1.48
11 = 100 - 249 Emps.	EMPLOYN2 Model 3 (11)	1.44
12 = 250 – 3500 Emps.	EMPLOYN2 Model 4 (11)	0.36

6.5 Discussion

The findings presented so far in these results offer sufficient evidence with which to reject the null hypotheses of no relationship between owner-manager personality / attitudes and co-operative propensity. Although one has yet to evaluate the results relating to co-operative propensity amongst other types of co-operation, sufficient evidence is presented here to conclude that a number of hypothesised factors are in fact antecedents to competitor co-operation. It has been shown that a respondent's competitor co-operative propensity will be considerably higher where they are a member of a business club; currently co-operate with distributors or customers; think decisions through to a moderate level; occasionally reject the advice and guidance of others; have a high level of confidence in his / her ability to evaluate risk effectively and employ less than eight people.

These conclusions alone may prove valuable to owner-managers or third parties who are looking to initiate or maintain co-operative relations, as they identify an arena (business clubs) in which potential co-operative firms may be found, as well as identifying criteria and characteristics commonly found amongst owner-managers with a high co-operative propensity. Individuals looking to identify co-operative parties in this way now have a list of factors on which data can easily be collected overtly by public sector employees (such as network brokers or Business Link employees) or covertly through telephone conversations by other owner-managers. These factors can be used therefore in this way as a means of screening owner-managers with a high co-operative propensity from those with a low

propensity or no tendency towards co-operative activity, confident in the knowledge that the factors are statistically grounded and based on a robust model which is capable of classifying owner-managers accurately nearly eighty percent of the time. A more targeted approach of the type proposed here will therefore enable the public sector to save or make better use of staff and financial resources, whilst also minimising the amount of non-commercial demands placed on the SME sector, thereby enabling firms that are able to grow and retain increasingly numbers of employees to do so, without facing excessive time demands from third parties.

However, the reader is however referred back to the results relating to third party co-operative involvement, where it was found that many owner-managers simply did not desire third party / public sector involvement, especially where that involvement was likely to be high. This research has succeeded in identifying a relationship between various antecedents and competitor co-operative propensity, it has not however addressed nor has it sought to address the potential relationship between an owner-manager's attitudes towards third party / public sector involvement and co-operative propensity. Third parties should therefore be mindful of this when establishing contact with these individuals, and should not be surprised if their activities are met with apathy or even hostility.

The next chapter will review the results relating to consultant, customer, distributor and supplier co-operative propensity. In addition a model will be constructed which identifies co-operative success factors. The identification of these factors can then be used to assist existing or emerging networks, by highlighting the keys to co-operative success.

Chapter Seven – Non-Competitor Co-operative Propensity Logistic Regression Models

7.1 Introduction

The following chapter outlines non-competitor co-operation results derived from analysis of the first standardised postal questionnaire. An identical methodology to that employed in the logistic regression analysis of the competitor co-operative propensity (as discussed in Chapter Six) is utilised here. Models are advanced for each of the five remaining types of co-operation: General; Distributor; Customer; Supplier and Consultant. As with the competitor co-operative propensity logistic regression model, significant antecedent variables relating to owner manager personality; business attitudes, initial motivation for starting the business, membership of business related clubs, propensity to co-operate with other parties and respondent – firm demographics are entered into the model and deleted using backward elimination. The process is repeated until the optimal model with the minimum number of variables is produced.

Given that the principal focus for research presented in this document is competitor-based co-operation, which has been discussed in detail in the preceding chapter, results presented here centre around multivariate (logistical regression analysis). Variables that were identified as significant at the uni-variate level, using appropriate chi-square tests, were used as the starting point for constructing each of the models. Given, that the model derivation process has already been discussed, only the final exponent beta scores for each of the five co-operation logistic regression models advanced are presented and discussed here (specific details appertaining to model construction and results can be found in Appendix V.

Table 7.1: Standardised Exponent Beta Scores for General Co-operative Propensity Logistic Regression Model

ABBREVIATED VARIABLE DESCRIPTOR	MODEL INTERNAL CODE	STANDARDISED EXPONENT BETA
A1A – SAW AN AVAILABLE MARKET OPPORTUNITY	A1A	
Yes		4.29
No		0.23
D4 – ABLE TO GENERATE IDEAS WHEN I NEED TO		
Somewhat	D4 Model (Dev. L.) (1)	0.48
Moderately so	D4 Model (Dev. L.) (2)	3.10
Very much so	D4 Model (Dev. F.) (2)	0.67
D11 – WILLING AND ABLE TO LISTEN TO OTHERS		
Not at all	D11 Model (Dev. L.) (1)	0.74
Somewhat	D11 Model (Dev. L.) (2)	0.24
Moderately so	D11 Model (Dev. L.) (3)	3.63
Very much so	D11 Model (Dev. F.) (3)	1.54
D15 – BELIEVE BUSINESS IS INFLUENCED BY ECONOMY ...		
Not at all	D15 Model (Dev. L.) (1)	0.0016
Somewhat	D15 Model (Dev. L.) (2)	8.68
Moderately so	D15 Model (Dev. L.) (3)	6.13
Very much so	D15 Model (Dev. F.) (3)	11.84
D30 – FOUND IT DIFFICULT TO ACHIEVE GOALS		
Not at all	D30 (Dev. L.) Model	1.30
Somewhat	D30 (Dev. L.) Model	4.86
Moderately so	D30 (Dev. L.) Model	0.77
Very much so	D30 (Dev. F.) Model	0.21

D47 – OFTEN IGNORE ADVICE AND GUIDANCE OF OTHERS		
Not at all	D47 (Dev. L.) Model	1.92
Somewhat	D47 (Dev. L.) Model	0.20
Moderately so	D47 (Dev. L.) Model	2.18
Very much so	D47 (Dev. F.) Model	1.17
HOW MANY GROUPS IS THE RESPONDENT A MEMBER OF?		
0 Groups	Member1 (Dev. L.)	0.06
1 Group	Member1 (Dev. L.)	0.64
2 Groups	Member1 (Dev. L.)	0.26
3 Groups	Member1 (Dev. L.)	0.11
4 Groups	Member1 (Dev. F.)	883.78

7.2.1 General Co-operative Propensity Logistic Regression Model Results

Using backward elimination it was possible to construct a logistic regression model which required only seven of the fifteen variables which were entered at stage one (see Table 7.4). Despite employing less than half of the original variables, the final multivariate model is in fact very good. The –2 log likelihood and goodness of fit statistics are both satisfactory, and the overall significance of the model is excellent, with its likelihood of producing a similar result simply by chance being less than one in ten thousand. In terms of classifying the data the model is once again encouraging. Of the sixty-four respondents who indicated they had not co-operated with anyone, forty-eight were predicted correctly by the model (75.00%). The model was even better at predicting which respondents had co-operated in any capacity; fifty-nine of the sixty-nine respondents who indicated that they had co-operated were classified correctly. Overall the model classifies the data accurately in just over eighty percent of the analysed cases (80.45%). Given that random selection of respondent's general co-operative propensity would have been correct on average one time

in two, any figure over fifty percent represents an improvement. The model extended here for general co-operative propensity though exceeds this level by a significant margin, and as such represents a significant improvement on the aforementioned probability based approach.

Examination of Table 7.1 that summarises standardised exponent beta scores from both the deviation - last and first, general co-operative propensity models, reveals the following interesting results.

Respondents who indicated that their principal motivation for starting or running their business was that they had seen an available market opportunity were found to be over four times more likely to co-operate in any capacity, than respondents who were motivated on different grounds.

Individuals who selected the "Moderately so" position when asked to indicate the extent to which they agreed with statement D4 – "I am able to generate lots of ideas when I need to" were over three times more likely to co-operate than their counterparts who had indicated otherwise.

Similar preference for the "Moderately so" position was noted for co-operators who responded to statement D11 ("I am willing and able to listen to and evaluate the advice and guidance of others on how to run my business"). Respondents who indicated moderate agreement with statement D11 were found to be over three and half times more likely to co-operate in any capacity, than those who had not. Individuals, who responded "Very much so" also possessed a higher co-operative propensity, they were over one and a half times more likely to co-operate than those who had not.

Actors who selected the "Very much so" position in relation to statement D15 ("I believe that the performance of my business is powerfully influenced by conditions in the environment / economy etc.") were nearly times more likely to co-operate than those who had not. High co-operative propensities were also noted for those that had selected the "Somewhat" and "Moderately so" positions. However, given that results are derived in a referential manner, the very low co-operative propensity figure for the "Not at all" position is likely to have exaggerated these figures. Clearly exponent beta scores, along with variables which are extended here as significant, will need to be re-tested as part of a follow up study, before it is possible to certain about the results, or make concrete conclusions.

Statement D30 - "I have found it difficult to achieve the aims and goals I have set for myself and my business" was also found to be associated to general co-operative propensity when modelled using logistic regression. Once again the relationship between the variables is not a simple linear one. Respondents who indicated they did not agree with the statement were thirty percent more likely to co-operate than those that did not, whilst those individuals who indicated "Somewhat" were nearly five times more likely to co-operate. Conversely, those who indicated either of the scales other two positions were less likely to co-operate.

In response to statement D47 – "I often ignore the advice and guidance of others, including other business owners, business advisors, colleagues, etc." individuals who indicated moderate agreement were most likely to co-operate with others in any capacity (over twice as likely) than those who had not so indicated. Those that indicated "Not at all" and "Very much so" were also more likely to co-operate, although to a lesser extent, 1.92 and 1.17

times respectively.

The number of business related groups to which a respondent was affiliated was also found to be significantly related to their general co-operative propensity, although once again the relationship was not a linear one. Respondents who were not members of any business related groups were far less likely to co-operate than those that were, nearly seventeen times less likely to do so, whilst those who were associated with four business related groups (of which there were very few) were nearly nine hundred times more likely to co-operate with others than those who were not members of so many groups. The relationship could be viewed as a linear one, but for the standardised exponent beta score recorded for respondents who were members of a single business related group, these individuals were just over sixty percent as likely to co-operate with others than those that did not. Given the high standardised exponent beta score associated with respondents who indicated they were members of four groups, it seems reasonable to assume that in reality individuals associated with one group possess a relatively high general co-operative propensity.

The reader is of course reminded that the "Member1" variable is an aggregate score of individual's responses to question A2 - Are you involved in or a member of the following? (Please tick all appropriate boxes) (a) Business Club, (b) Chamber of Commerce, (c) Freemasons' Lodge, (d) Strategic Alliance, (e) Trade Association or (f) Other, Please State; when reference then is made to the number of groups the respondent is a member of, reference is being made to the number of different groups with which they are associated rather than the absolute number of groups of all types to which they may be affiliated. A respondent may therefore be categorised within the "Member1" variable as being a member of only one type of group, whilst in fact being affiliated to two or more groups of the same type.

7.2.2 General Co-operative Propensity Model - Summary and Discussion

Seven variables have been discussed, which have been shown to be significant antecedents to respondent's general co-operative propensity. Whether an individual was originally motivated to start or run their business because they saw an opportunity in the market, whether they are able to generate ideas when they need to, the degree to which they are willing to listen to others, the extent to which they believe external factors affect their firm, whether they have found it difficult to achieve personal or organisational goals and the number of different types of business related groups to which they are affiliated, have all been shown to be significant multivariate determinants of general co-operative propensity.

Results presented have suggested that respondents whose principal motivation for starting their business, was that they saw an available market opportunity, were more likely to co-operate with other actors than their counterparts who were motivated by other means. This seems reasonable when it is recognised that these individuals are effectively stating that their initial motivation was one of market orientation and reaction to needs in the market. If past behaviour is taken as being a good indicator of future behaviour as a number of psychologists have suggested it can (Conley, 1984c), it would seem reasonable to conclude that the majority of individuals whose motivation was initially one of market orientation, are likely to maintain that approach. A likely explanation for the significantly higher co-operative propensity displayed by such individuals, is that they were simply reacting to current and perceived future needs of their market. Where they were unable to satisfy those needs through products, services, resources and expertise available within the organisation, co-operation was pursued as a means of meeting market needs and wants.

The ability to generate ideas (statement D4) was also related to an individual's likely co-operative propensity. Standardised exponent beta scores presented would appear to indicate that respondents who indicate moderate agreement with statement D4 ("I am able to generate lots of ideas if I need to") are most likely to co-operate with other actors. Given that none of the respondents included in the general co-operative propensity model indicated out and out disagreement with the statement (i.e. "Not at all"), this would appear to suggest that individuals who possess mid-level creativity or problem solving are most likely to co-operate with others. This result seems logical, especially if reasoning for upper and lower scale co-operative propensity scores is also extended. Respondents who indicated upper scale agreement (i.e. "Very much so") were likely to generate, or believed they generated, a sufficient number of feasible ideas for dealing with their problems, which did not necessitate co-operative interaction, and which given the additional problems that co-operation could potentially bring favoured those options in its place. Conversely, individuals who indicate lower scale agreement (i.e. "Moderately so") were unable to see that co-operation might represent a potential solution to the problems and opportunities that they encountered.

Individuals who were willing to listen to others, and considered themselves able to evaluate the advice and guidance that they gave were shown to possess higher co-operative propensities than those respondents who did not. The highest co-operative propensity was recorded for individuals who indicated moderate agreement with the statement. A possible explanation for the co-operative propensity differentials recorded, rests in the fact that actors who do not actively seek the views of others, are likely to favour a "go it alone" approach when conducting their business. On the other hand, those who listen to the opinions of others to a greater extent are demonstrating the fact that they believe that other

people, at least potentially are able to offer an insight into their organisation that they alone are not able to achieve.

Results presented would also appear to suggest that research investigating the possibility of a relationship between a respondent's co-operative propensity and their locus of control may well prove to be fruitful. Once again though, the association between respondent's relative co-operative propensities and their responses to statement D15 ("I believe that the performance of my business is powerfully influenced by conditions in the environment / economy etc") does not appear to be a simple linear one. In line with expectations, individuals who indicated disagreement with the statement, that is to say, probably have an internal locus of control; are much less likely to co-operate with others than those who have an external locus of control. A conceivable reasoning for this behaviour is that respondents, who indicated that the macro-environment did affect their firm, believed that the most effective way of dealing with this external threat rested in co-operating with others. Conversely, those who did not believe that the environment, economy or other factors impinged on the performance of their firm saw nothing to gain from co-operating with others in this way.

In relation to statement D30 ("I have found it difficult to achieve the aims and goals I have set for myself and my firm") and general co-operative propensity the results presented indicated that individuals who responded "Moderately so" or "Very much so" were less likely to co-operate than those who had not. Perhaps individuals who indicated that they found it difficult to achieve their aims and goals, simply did not consider co-operation as a potential solution to their problem, or if they did believed that it would be a source of more problems rather than less, with the opposite being true for respondents who found goal achievement less problematic.

On preliminary examination statement D47 ("I often ignore the advice and guidance of others, including other business owners, business advisors, colleagues, etc.) would appear to be asking for similar responses to those elicited by statement D11 ("I am willing and able to listen to and evaluate the advice and guidance of others on how to run my business). However, as has been shown by the Durham Business School Personality Instrument reliability analysis presented in Appendix IV, the correlation between the items is poor, less than twenty-five percent (they would need to be in excess of seventy percent before any grounds for arguing an association between the two variables could be supported), and as such, they should be considered as measuring different attitudes or traits.

Given that the two variables D11 and D47 are not measuring the same thing, what are they measuring? Statement D11 would appear semantically, to be a measure of the degree to which a respondent is prepared to listen to the views and opinions of others, whilst statement D47 seems to be a measure of the extent to which they are prepared to act on the opinions of others. The two variables are therefore clearly not the same. It is quite possible that an individual may actively seek the advice and guidance of others, whilst at the same time rejecting much of what they hear.

Respondents who indicated they were least likely to co-operate with others were those that they were "Somewhat" inclined towards rejecting the advice and guidance of others, whilst those who indicated other positions were more likely to co-operate. No obvious explanation for this behavioural relationship offers itself, and as with all of the relationships outlined here, it is probable that the true nature of the association between antecedent variables and an individual's co-operative propensity will only truly become clear upon further empirical investigation.

Results also indicate the existence of a relationship between a respondent's membership of a number of different business related groups and their general co-operative propensity. Findings suggest that individuals who are affiliated to four groups are much more likely to co-operate than their counterparts who are not associated with so many groups. The small number of respondents who were members of four groups would however appear to be skewing the data and exaggerating the standardised exponent beta scores for these individuals. This caveat aside, it is reasonable to expect to see an association between general co-operative propensity and group membership, as members who are attached to such groups are effectively demonstrating a belief that interacting with others can be beneficial. The exact nature of the association between the number of different groups to which an individual is associated, and their general co-operative propensity will as with all relationships extended here, have to be tested again empirically at a later date. Concrete conclusions relating to these variables should therefore be postponed until such a time as the results of future studies are known.

The preceding section has outlined and discussed a general co-operative propensity model that represents a potential explanatory tool for the understanding of owner-managers general co-operative behaviour. As with the competitor co-operative propensity model extended in the previous chapter, it is recognised that this is a preliminary model, and that it is only through further empirical investigation and testing that it will be possible to draw concrete conclusions relating to owner-manager's general co-operative propensity. When considered in light of these limitations it can be viewed as a good preliminary explanatory tool. Both the model's significance and its ability to classify the data correctly are excellent, only time and empirical investigation using a larger and more nationally representative sample, will determine whether the model is really as good as it currently

seems.

7. 3 Distributor Co-operation

Table 7.2: Standardised Exponent Beta Scores for Distributor Co-operative Propensity Logistic Regression Model

ABBREVIATED VARIABLE DESCRIPTOR	MODEL INTERNAL CODE	STANDARDISED EXPONENT BETA
A1B – WANTED TO BE OWN BOSS		
Yes	A1B	5.25
No		0.19
HAS THE RESPONDENT CO-OPERATED WITH SUPPLIERS?		
Yes	CO_SUPPL	8.24
No		0.12
D4 – ABLE TO GENERATE IDEAS WHEN I NEED TO		
Somewhat	D4 Model (Dev. L.) (1)	0.39
Moderately so	D4 Model (Dev. L.) (2)	1.94
Very much so	D4 Model (Dev. F.) (2)	1.33
D23 – KNOW HOW TO CONVERT OPPORTUNITIES INTO SUCCESS		
Not at all	D11 Model (Dev. L.) (1)	128.83
Somewhat	D11 Model (Dev. L.) (2)	0.23
Moderately so	D11 Model (Dev. L.) (3)	0.11
Very much so	D11 Model (Dev. F.) (3)	0.30

7.3.1 Distributor Co-operative Propensity Logistic Regression Model – Results and Discussion

Standardised exponent beta scores summarised in Table 7.2 above, demonstrate that it was possible to construct a good logistic regression model that required only four of the fourteen variables entered at stage one. Despite the relatively small number of variables that it employs, the final multivariate model derived is in fact a good one. Once again the – 2 log likelihood and goodness of fit statistics are both satisfactory, and the overall significance of the model is excellent. Its ability to classify the data entered into it is also encouraging. The final iteration of the model was able to accurately classify co-operating and non-co-operating respondents to within one percent of one another. Overall then the model classifies the data accurately in just over seventy-five percent of the analysed cases (75.51%). Once again, as was the case with the competitor and general co-operative propensity logistic regression models advanced earlier, the distributor co-operation model extended here is a significant improvement on a random selection based approach, in which one could, with a big enough sample expect to accurately classify the data in fifty percent of cases.

Examination of Table 7.2 that summarises standardised exponent beta scores from both the deviation - last and first, distributor co-operative propensity models, reveals the following interesting results.

Respondents who indicated that they were members of a Chamber of Commerce were over five times more likely to co-operate with distributors than their counterparts who were not affiliated to such a group. One possible, although by no means conclusive explanation for this finding maybe attributed to the fact that members of these groups may display a greater

awareness of the role that a distributor can play in their business. Whether this awareness comes through membership of the chamber of commerce, and the events and services it provides, or whether individuals who join these groups are more likely to co-operate (or already co-operate) with their distributors before they join their chamber is however not clear.

Not surprisingly the results illustrated above demonstrate that individuals who co-operate with their suppliers are also more likely to co-operate with distributors. In fact, respondents who indicated that they co-operated in some way with their suppliers were over eight times more likely to co-operate with their distributors than those who indicated that they did not. Supply chain relationship management is an area that has been both the subject of increased academic scrutiny and practitioner usage in recent years. Research has suggested that management of the chain at both the input (e.g. supplier) and output (e.g. distributor / customer) stages can have a beneficial effect for the firm, in terms of factors such as product quality (Larson, 1994), associated transaction costs (Dowst, 1989), just-in-time delivery (Ayliffe, 1995), reduced stock levels (Ayliffe, 1995), quicker new product development (Woodruff, 1993) and a means of entering new markets (Larson, 1991). It is therefore understandable that individuals, who show an interest in eliciting benefits by interacting with members of one end of the chain, will also show interest in interacting with members from the other end. The absence of customers from the model can be explained by the fact that from the perspective of many companies the distributor is the customer. Although the distributor is not the end user of the product, it is likely that he/she will be in contact with the final consumer, whether this link be direct or through another intermediary. Either way, it is likely that distributors will be more able to obtain accurate customer feedback than the firm that engages them. This argument is likely to be even more valid where the end users of a firm's products are widely dispersed, high in

number, or difficult to identify.

As was the case with the general co-operative propensity model discussed in the previous section, respondent's responses to statement D4 ("I am able to generate lots of ideas when I need to") were significantly related to their distributor co-operative propensity. Although the standardised exponent beta scores are not the same, they both follow a similar non-linear relationship, it therefore seems reasonable to extent a similar reasoning for this behaviour. Respondents who indicated strong agreement with the statement (i.e. "Very much so") were likely to generate, or believed they generated, a sufficient number of feasible ideas for dealing with their problems, which did not necessitate co-operative interaction, and given the additional number of problems that co-operation potentially could bring, favoured those options in its place. Conversely, individuals who indicated lesser agreement (i.e. "Moderately so") were unable to see that co-operation might represent a potential solution to the problems and opportunities that they encountered.

Individuals who indicated "Not at all" in relation to statement D23 ("I know how to convert opportunities into real business") were over one hundred and twenty-eight times more likely to co-operate with competitors than those respondents who did not. Once again, however, the standardised exponent beta scores should be viewed with caution. The presence of a relatively small number of outliers in the model, who indicated "Not at all" may well be exaggerating the extent to which these individuals are more likely to co-operate. It is only through empirical testing of the model using another the same research instrument, and a different sample, that it will be possible to make concrete conclusions with regards to the degree to which respondents who indicate one position on a scale, are more likely to co-operate than those who do not.

7.4 Customer Co-operation

Table 7.3: Standardised Exponent Beta Scores for Customer Co-operative Propensity Logistic Regression Model

ABBREVIATED VARIABLE DESCRIPTOR	MODEL INTERNAL CODE	STANDARDISED EXPONENT BETA
A2C – IS THE RESPONDENT A MEMBER OF A FREEMASON'S LODGE?		
Yes	A2C	5.59
No		0.18
HAS THE RESPONDENT CO-OPERATED WITH COMPETITORS?		
Yes	CO_COMPE	2.94
No		0.34
HAS THE RESPONDENT CO-OPERATED WITH SUPPLIERS?		
Yes	CO_SUPPL	4.61
No		0.22
D23 – KNOW HOW TO CONVERT OPPORTUNITIES INTO SUCCESS		
Not at all	D23 Model (Dev. L.) (1)	4.56
Somewhat	D23 Model (Dev. L.) (2)	1.00
Moderately so	D23 Model (Dev. L.) (3)	0.80
Very much so	D23 Model (Dev. F.) (3)	0.27
D33 –BELIEVE IT IS DIFFICULT TO CONTROL BUSINESS		
Not at all	D33 Model (Dev. L.) (1)	1.36
Somewhat	D33 Model (Dev. L.) (2)	2.06
Moderately so	D33 Model (Dev. L.) (3)	0.85
Very much so	D33 Model (Dev. F.) (3)	0.42

TYPE OF BUSINESS THE RESPONDENT OPERATES		
Agricultural & Extractive	Bustype Model (Dev. L.) (1)	0.23
Manufacturing	Bustype Model (Dev. L.) (2)	4.06
Service Sector	Bustype Model (Dev. F.) (2)	1.07
HOW MANY GROUPS IS THE RESPONDENT A MEMBER OF?		
0 Groups	Member1 (Dev. L.)	0.21
1 Group	Member1 (Dev. L.)	0.38
2 Groups	Member1 (Dev. L.)	0.15
3 Groups	Member1 (Dev. L.)	0.36
4 Groups	Member1 (Dev. F.)	228.56

7.4.1 Customer Co-operative Propensity Logistic Regression Model – Results and Discussion

Standardised exponent beta scores summarised in Table 7.3 above, demonstrate that it was possible to construct a good logistic regression model that required only seven of the twenty-three variables entered at stage one. Despite the relatively small number of variables that it employs, the final multivariate model derived is a good one. Once again the –2 log likelihood and goodness of fit statistics are satisfactory, and the overall significance of the model is excellent. Its ability to classify the data entered into it is also encouraging. The final iteration of the model was able to accurately classify customer co-operating and non-co-operating respondents to within six percent of one another. Although the model is better at predicting co-operators (76.71% versus 71.74%) its ability to correctly classify over seventy percent of the data for both co-operators and non-co-operators makes it a highly satisfactory model. Overall the model classifies the data

accurately in just under seventy-five percent of the analysed cases (74.30%). Once again, as was the case with the competitor, general and distributor co-operative propensity logistic regression models advanced earlier, the customer co-operation model extended here is a significant improvement on a random selection based approach.

Examination of Table 7.3 that summarises standardised exponent beta scores from both the deviation - last and first, distributor co-operative propensity models, reveals the following results.

Respondents who indicated that they were members of a Freemason's Lodge were found to be over five and a half times more likely to co-operate with their customers than respondents who were not members. Given the mystery that is associated with the Freemasons, and the dearth of research into their activities, it is only possible to speculate as to the reasons for which members of their lodges, are more likely to co-operate with their customers than non-members. It is possible, given the rumours that pervade in relation to these groups, that members of them give one another preferential treatment when selecting individuals or firms with which to trade. It is only through extensive research into the activities of the Freemasonry movement, an objective which this research programme has not been able to realise (the reasons for which are detailed in Appendix IV), that it will be possible to advance firm reasoning for the relationship between customer co-operation and Freemasonry membership.

Both individuals who co-operated with their competitors and individuals who co-operated with their suppliers were shown to possess a higher co-operative propensity than their counterparts who did not. Respondents who indicated that they co-operated with competitors were nearly three times more likely to co-operate with customers than those

who had not. Given the higher levels of risk associated with defection by competitor co-operative partners, it is perhaps understandable that individuals who are prepared to co-operate with their competitors are also more likely to co-operate with their customers. In fact a relationship at least at the uni-variate level exists between all types of co-operation, with respondents who co-operate in one capacity being more likely to co-operate in another. The customer co-operative propensity logistic regression model though, is the only multivariate model in which competitor co-operative propensity is shown to be a good predictive indicator. As with many of the findings reported in this research programme, it is only through follow up studies in which empirical scope is cast less broadly that it will be possible to offer satisfactory and conclusive reasoning for the relationships noted here.

As has already been indicated respondents who indicated that they co-operated with their suppliers were also more likely to co-operate with their customers. In fact, individuals who co-operated with their suppliers were over four and a half times more likely to co-operate with customers. Similar reasoning to that extended for the relationship between distributor and supplier co-operative propensity can be advanced here. Respondents who seek to manage and establish relationships at one end of the supply chain are more likely to develop similar relationships at the other end.

As with the distributor co-operative propensity model discussed prior to this one, a significant relationship was found to exist between the dependant variable, in this case, customer co-operation, and individual's responses to statement D23 ("I know how to convert opportunities into real successes"), this however is where the similarity ends. Unlike the distributor model, the relationship between customer co-operation and statement D23 is a linear one. Respondents, who indicated that they had no idea as to how to convert opportunities into successes (i.e. indicated "Not at all"), were over four and a half times

more likely to co-operate with their customers. Individuals who indicated partial agreement (i.e. indicated "Somewhat") were no more likely to co-operate, whereas those who indicated either "Moderately so" or "Very much so" were less likely to co-operate with their customers.

The model presented would also suggest that there is a multivariate relationship between respondents responses to statement D33 ("I believe it is difficult for me to control what happens in my business") and their customer co-operative propensity. Respondents who indicated strong agreement with the statement (i.e. "Very much so") were much less likely to co-operate than those who indicated a different position on the scale. Once again however, the noted relationship is not a linear one. Although it is true to say that individuals who chose the "Not at all" option were more likely to co-operate than those who did not, their co-operative propensity was not as high as respondents who had indicated "Somewhat" (scores of 1.36 and 2.06 were recorded respectively). This would appear to suggest that individuals who believe that it is difficult to control their business will avoid co-operation, as co-operation is likely to be a source of other factors or problems that they will not be able to control. Conversely, respondents who believe that they have a high or fair degree of control over their business, do not see co-operation as being a source of additional difficulties, or if they do, believe they are equally capable of controlling those difficulties as well.

The business sector in which respondents operated was also shown to affect their propensity to co-operate with customers. Customer co-operation was at its highest in the secondary (manufacturing) sector where respondents were shown to be over four times more likely to co-operate than non-manufacturing counterparts. Tertiary sector (service industry) firms also had a higher co-operative propensity, although this was only

marginally higher than non-service sector based firms. The lowest customer co-operative propensity was recorded for firms operating in the primary (agricultural and extractive) sector, who were shown to be over four times less likely to co-operate with customers than respondents who were not operating in this sector. As with the other relationships which have been discussed, both with regard to this model and those which precede and follow it, the standardised exponent beta scores reported should be considered as indicative, it is only through re-testing of the research instrument with further samples, that associations and reasoning advanced here will be able to be sustained. This obvious caveat aside, results presented, would suggest that the sector in which a firm is based can be a crucial determinant of their customer co-operative propensity. If the findings reported here are supported by similar findings by follow up studies, the implications for actors looking to stimulate inter-firm networking / co-operation are clear. These actors would be well advised then, at least as a general rule, to avoid firms operating in the primary sector, and concentrate their attention on secondary sector – manufacturing based firms.

As with the general co-operative propensity logistic regression model discussed above, a non-linear relationship between customer co-operative propensity and the number of different types of group to which the respondent was affiliated was established. Once again however, the exact nature of this relationship is not entirely clear, and it is only through a less broad empirical study into customer co-operation that the exact nature of this relationship is likely to become clear.

The customer co-operative propensity logistic regression model summarised above, would appear to be a good one, both its significance and its ability to accurately classify respondents into customer co-operating and non-co-operating groups are encouraging. As with the other models outlined and discussed here though, it should be viewed as a

preliminary model. Until such a time as it has received additional empirical investigation, it would be inadvisable to utilise it beyond the indicative level. It does however, like the other models advanced here represent a significant advancement on existing network or business co-operation research. Although it will only be possible through time and further testing to determine how good it and they actually are, they should be set fairly against the current context of empirical impoverishment which characterises existing network and co-operation based academic research.

7.5 Supplier Co-operation

Table 7.4: Standardised Exponent Beta Scores for Supplier Co-operative Propensity Logistic Regression Model

ABBREVIATED VARIABLE DESCRIPTOR	MODEL INTERNAL CODE	STANDARDISED EXPONENT BETA
HAS THE RESPONDENT CO-OPERATED WITH DISTRIBUTORS?		
Yes	CO_DISTR	7.39
No		0.14
HAS THE RESPONDENT CO-OPERATED WITH COMPETITORS?	CO_CUSTO	
Yes		4.92
No		0.20
TYPE OF BUSINESS THE RESPONDENT OPERATES		
Agricultural & Extractive	Bustype Model (Dev. L.) (1)	2.27
Manufacturing	Bustype Model (Dev. L.) (2)	0.36
Service Sector	Bustype Model (Dev. F.) (2)	1.21

7.6 Consultant Co-operation

Table 7.5: Standardised Exponent Beta Scores for Consultant Co-operative Propensity Logistic Regression Model

ABBREVIATED VARIABLE DESCRIPTOR	MODEL INTERNAL CODE	STANDARDISED EXPONENT BETA
A1F –MANAGE BUSINESS NOT A SHAREHOLDER	A1F	
Yes		0.16
No		6.28
HAS THE RESPONDENT CO-OPERATED WITH SUPPLIERS?	CO_SUPPL	
Yes		3.27
No		0.31
D2 – ACTIVELY SEEK OPINIONS OF OTHERS		
Not at all	D2 Model (Dev. L.) (1)	2.68
Somewhat	D2 Model (Dev. L.) (2)	0.65
Moderately so	D2 Model (Dev. L.) (3)	0.32
Very much so	D2 Model (Dev. F.) (3)	1.81
D4 – ABLE TO GENERATE IDEAS WHEN I NEED TO		
Somewhat	D4 Model (Dev. L.) (1)	0.25
Moderately so	D4 Model (Dev. L.) (2)	1.98
Very much so	D4 Model (Dev. F.) (2)	2.04
D19 – UNCOMFORTABLE WITH IDEA OF RUNNING BUSINESS		
Not at all	D19 Model (Dev. L.) (1)	215.91
Somewhat	D19 Model (Dev. L.) (2)	599.80
Moderately so	D19 Model (Dev. L.) (3)	0.0000
Very much so	D19 Model (Dev. F.) (3)	559.39
COUNTY IN WHICH RESPONDENTS FIRM IS BASED		

Avon	County Model (Dev. L.) (1)	0.74
Cornwall	County Model (Dev. L.) (2)	0.90
Devon	County Model (Dev. L.) (3)	1.57
Dorset	County Model (Dev. L.) (4)	0.65
Somerset	County Model (Dev. L.) (5)	0.0001
Wiltshire	County Model (Dev. L.) (6)	2.11
S. Glamorgan	County Model (Dev. L.) (7)	0.0000
Gloucestershire	County Model (Dev. L.) (8)	7.17
Oxfordshire	County Model (Dev. L.) (9)	21274.72
Gwent	County Model (Dev. F.) (9)	1147.26
HOW MANY GROUPS IS THE RESPONDENT A MEMBER OF?		
0 Groups	Member1 (Dev. L.)	0.01
1 Group	Member1 (Dev. L.)	0.01
2 Groups	Member1 (Dev. L.)	0.06
3 Groups	Member1 (Dev. L.)	0.16
4 Groups	Member1 (Dev. F.)	497543.4

7.6.1 Consultant Co-operative Propensity Logistic Regression Model – Results and Discussion

Standardised exponent beta scores summarised in Table 7.5 above, demonstrate that it was possible to construct a good logistic regression model that required only seven of the eighteen variables entered at stage one. Despite the relatively small number of variables that it employs, the final multivariate model derived is a good one. Once again the –2 log likelihood and goodness of fit statistics are satisfactory, and the overall significance of the model is excellent. The model classified respondents who did not co-operate with

consultants accurately in over seventy-six percent of cases, and those who did co-operate correctly in just over seventy-three percent of cases. The overall model was therefore able to classify the data accurately in nearly seventy-five percent of the analysed cases (74.83%), an undeniable improvement on the fifty percent level which could be expected as a result of allocating respondents to a group randomly.

Examination of Table 7.5 that summarises standardised exponent beta scores from both the deviation - last and first, distributor co-operative propensity models, reveals the following interesting results.

Of all the models presented here, the consultant co-operative propensity logistic regression model is arguably the most unreliable. The presence of a large number of high standardised exponent beta scores makes the final model questionable, but as with the other models that have been advanced here, it is only through testing by further empirical studies that it will be possible to draw a definite conclusion to this effect.

Respondents who indicated that they managed the firm and were not shareholders were found to be over six times less likely to co-operate with consultants than their owner-manager counterpart. This finding would seem reasonable given the retention, employment or co-operation with these individuals can be a costly business, both in terms of the financial costs associated with such activities, and the opportunity cost of not using their time elsewhere. It is probable then that only owner-managers will (at least in micro and small firms) be a position to initiate such activities. The fact that owner-managers are over six times more likely to co-operate with consultants than managers thus becomes less surprising.

The logistic regression model results summarised here also indicate that respondents who co-operate with their suppliers are also more likely to co-operate with consultants, in fact these individuals are over three times as likely to co-operate in this way. No obvious reason for this finding aside from that extended elsewhere presents itself. Briefly restating that argument, individuals who co-operate with others in one way are more likely to co-operate in another. What is not clear here however, is why respondents who co-operate with suppliers are any more likely to co-operate with consultants, than those who co-operate with distributors, customers or competitors. This association, like many of the relationships identified within this research, will need to be tested and validated by future research.

Intriguingly, individuals who actively seek out others and listen to what they have to say about their business (i.e. those who indicated "Very much so" in relation to statement D2) and those who selected the "Not at all" position, were both more likely to co-operate with consultants than those who did not (i.e. "Somewhat" and "Moderately so"). The only conceivable explanation for this behaviour, would appear to be that respondents who indicated "Not at all" might have been answering the question in relation to advice and opinions offered by their peers or employees, and although they do not actively seek their guidance, believe that their business can benefit from the advice and expertise of a consultant. Those who indicated "Very much so" however, were as prepared to listen to the advice and guidance of a consultant, as they were from others with regards to their business.

The relationship between respondents' consultant co-operative propensity and their response to statement D4 ("I am able to generate lots of ideas when I need to" would appear to be a more straight forward, albeit ironic, linear one. Individuals who indicated

"Somewhat" (no one indicated "Not at all" in relation to this statement) were the least likely to co-operate with consultants, whereas those who indicated "Very much so" were the most likely to co-operate in this way. The fact that both individuals who indicated "Moderately so" and "Very much so" in relation to this statement are approximately twice as likely to co-operate with consultants as those that did not, would appear to suggest that these individuals attribute some of the creativity and problem solving they derive from consultants to themselves. Respondents who do not consider themselves as being capable of generating ideas either do not consider consultants as a capable or feasible source of those ideas or not aware of consultants operating in their field or market.

Results derived in relation to statement D19 ("I am uncomfortable with the idea of running my own business") suggest another non-linear relationship, between it and respondents consultant co-operative propensity. Individuals who indicate they are either very uncomfortable or slightly uncomfortable with the thought of running their business, are the most likely to co-operate with a consultant (i.e. those individuals who indicated "Very much so" or "Somewhat"). Respondents who indicated "Not at all" were also more likely to co-operate with consultants, but only about half as likely as those who indicated "Very much so" or "Somewhat". The paradox in this relationship comes in the form of respondents who indicated that they were moderately uncomfortable with the idea of running their firm. The model would appear to suggest that these individuals are not likely to co-operate with consultants at all. The only conceivable explanation for this relationship would seem to be that respondents who are moderately uncomfortable with the idea of running their business are more likely to want to manage it independently. The advice and guidance of consultants is thus spurned as a source of external management and interference.

Consultant co-operation would appear (at least from the results presented here) to be a county related activity, with some counties such as Oxfordshire and Gwent being represented by individuals who were more likely to co-operate with consultants. Whilst others, such as Somerset and Dorset were represented by respondents whose co-operative propensity was so low as to give the impression that they were never likely to co-operate in this way. The small sample of respondents which was used to construct this model (one hundred and forty seven) relative to the number of counties from which these individuals were drawn (ten) would suggest that it would be foolhardy to draw hard and fast conclusions in this regard, until a replica study has been conducted, which produces similar results.

Unlike several of the other models advanced here, the relationship between consultant co-operation and the number of different groups to which a respondent is affiliated is a linear one. Respondents who were not affiliated to any group, were much less likely to co-operate than those who were members of four. Given that these groups often have a number of consultants as members, it is understandable that such a relationship may exist. Individuals who are exposed to consultants in a number of different settings are provided with a greater number of opportunities in which to initiate and foster co-operative relations with them. Conversely, individuals who are members of fewer or even no groups have little or no opportunity to establish such a relationship.

As with the other models which have preceded it, the consultant co-operative propensity logistic regression model should be viewed as a provisional one, and should be considered more as a starting point for future research than an end point or solution in itself. Although the statistical tests used to determine the reliability and accuracy of the model suggest that it is a good one, it should be remembered that it is based on a relatively small sample, and

represents the findings of a single study. Conclusions drawn from it and actions based on it should take this fact into account.

7.7 Phase One Network Success Logistic Regression Model

In addition to the co-operative propensity models outlined above, the first standardised postal questionnaire, which was administered as part of phase one of this research, sought to identify some of the factors which affect co-operative success. All of the Durham Business School Personality Instrument personality / attitudinal items were included in the analysis, as well as respondent and firm demographic variables, B1 (which assessed the legality / formality of co-operative relations), B2 (which determined the length of time the respondent had known their last co-operative partner before they started co-operating with them) and B4 (which was used to determine whether the respondent's most rewarding co-operative agreement was motivated by long term, medium term or short term needs).

The initial intention was to once again use uni-variate chi-square analysis as a screening process for identifying variables that could be included in a multivariate logistic regression model. However, as was the case with the co-operative propensity logistic regression models, there was a substantial imbalance within the data. Over three and half times as many respondents (178 versus 48) indicated that their co-operative activities had been successful, than indicated that they had been less than successful (i.e. "Neither Successful / Unsuccessful", "Unsuccessful" or "Highly Unsuccessful"). This imbalance as has been discussed previously, results in the model producing a solution that favours the category for which more responses have been received. To avoid distortion of the model and the production of erroneous results and conclusions, the model was constructed using equal numbers of respondents from each of the dependent variables two categories. As was the

case with the co-operative propensity models discussed previously, respondents representing the larger category (in this case those who indicated that their co-operative activities had been successful) were chosen at random, whilst all respondents from the smaller category (in this case those that indicated that co-operative activities had been less than successful) were included in the model. There were therefore forty-eight respondents included in the model who classified their co-operative activities as having been a success, and forty-eight who indicated that they had been less than successful. Nineteen variables identified as being significant at the uni-variate level were entered at stage one. SPPS stopped computing the variables after twenty iterations, during which time it was unable to produce a model. Although this is a problem which may well be attributed to the small number of respondents included in the model, relative to the number of variables included, further analysis will be restricted to the presentation of uni-variate results, the discussion of which may be used to assist those pursing future research which seeks to model the data using logistic regression on a larger sample, or as a starting point for further uni-variate investigation into factors affecting co-operative success. Detailed discussion of these uni-variate relationships can be found in Appendix IX. Table below acts as a summary of these significant chi-square relationships.

Table 7.6 - Co-operative Success - Uni-variate results

Variable	Degrees of Freedom	Minimum Expected Frequency	Number of cells with less than 5 entries	Number of Missing observations	Correlation Significance
B4 – Agreement Initially motivated by LT, MT or ST Need	4	3.339	3 of 9 (33.3%)	83	0.00847
D4: Generate ideas when need to	6	0.149	5 of 12 (41.7%)	85	0.05257
D5: Many bus opportunities to take advantage of	6	0.050	5 of 12 (41.7%)	85	0.01314
D14: able to take advantage of opportunities	6	0.050	6 of 12 (50.0%)	85	0.04074
D16: know where want products / services to be in the market future	6	0.149	7 of 12 (58.3%)	85	0.07773
D23: know how to convert opportunities into success	6	0.198	5 of 12 (41.7%)	85	0.06886
D32: able to assess changes in the environment	6	0.455	5 of 12 (41.7%)	87	0.07816
D34: unsure about product / service which is central to the business	6	0.181	7 of 12 (58.3%)	86	0.02780
D36: Contingency plan where risk exists	6	0.182	6 of 12 (50.0%)	87	0.00008

D48: would rather work for someone else	6	0.950	5 of 12 (41.7%)	86	0.08995
D52: not sure which product or service to concentrate attention on	6	0.136	6 of 12 (50.0%)	86	0.00595
D53: evaluate courses of action in terms of risks involved	6	0.271	6 of 12 (50.0%)	86	0.02353
D54: see course of action through	4	0.498	3 of 9 (33.3%)	86	0.09945

The principal focus of the first standardised postal questionnaire was the effect of an individual's personality and other factors on their propensity to co-operate with competitors, distributors, customers, suppliers and consultants. Analysis of co-operative success, although part of its remit, was not its primary aim, it is co-operative success and more specifically network / group success which is investigated within the second standardised postal questionnaire, the results of which are presented in the next chapter. The focus of the next section is research hypotheses. The research hypotheses are represented and discussed in the light of the results presented here. Decisions are made as to whether sufficient evidence exists to reject the null hypotheses, or whether no relationship exists between the variables (or insufficient evidence has been presented to suggest that it does), in which case the null hypotheses are accepted as being correct.

7.8 Phase One Hypotheses and Discussion

Phase one of the research programme reported here has sought to investigate the following hypotheses, each of which will be discussed in turn.

H1: Co-operative propensity is affected by an owner-manager's personality.

H2: Co-operative propensity is affected by the owner-manager's membership with regards to business related groups.

H3: Co-operative propensity is affected by the owner-manager's demographic characteristics.

H4: Co-operative propensity is affected by the firm's demographic characteristics.

H5: An owner-manager's personality will influence their perception of co-operative success.

H1: Co-operative propensity is affected by an owner-manager's personality.

The relative failure of the Durham Business School Personality Instrument, at least as a tool for measuring personality (results derived from the reliability analysis suggest that the instrument is incapable of measuring the nine dimensions for which it was designed), makes it impossible to draw any concrete conclusions with regards to the existence of a relationship or indeed absence of it, between an individual's co-operative propensity and their personality. On a personality basis then, it is not possible to reject the null hypothesis,

or refute the potential existence of the relationship posited in alternative hypothesis one.

The administration of DBSPI as part of this research should though not be viewed as having been a complete failure; it did succeed in identifying a number of associations between attitudes expressed by owner-managers, and their propensity to co-operate with other business people. Given that attitudes are an expression of personality, the presence of such relationships would suggest that associations do exist between individuals' personality traits and their propensity to co-operate with others. It could therefore be reasonably predicted, that with a reliable personality research instrument (of which none are known to exist in the entrepreneurial research field) the existence of correlation's between owner-manager's personality, and their co-operative behaviour could be sustained. The case for an association between owner-manager personality and co-operative propensity is though by no means proven through this research. For this reason, all further discussion relates to the presence or absence of associations between respondent's attitudes and their co-operative propensity.

Sufficient support is provided from phase one results, with which to reject the null hypothesis in favour of revised alternative hypothesis one (Co-operative propensity is affected by an owner-manager's attitudes). Although a number of the contingency tables relating to the variables summarised and discussed as part of the phase one results, had in excess of twenty percent of their cells with a frequency of less than five, or a minimum expected frequency of less than five, the presence of so many "significant" relationships, would suggest that an owner-manager's attitudes and their co-operative propensity are indeed inter-linked. Clearly though results summarised here will need to be validated by future research, which would ideally draw on responses from a larger sample. It is of course possible that the number of cells with a significance of less than five is in fact

indicative of the strength of the relationship between the variables measured, and that a larger sample will act only to demonstrate the strength of these associations.

Although results presented here suggest that there is indeed a link between the respondent's attitudes and their propensity to co-operative with others, the attitudinal antecedents differ from one type of co-operation to another. (Tables 7.7 and 7.8 below identify the uni-variate and multivariate (logistic regression) attitudinal factors that were shown to be significant for each type of co-operation). Attitudes noted as significant for competitor co-operation may not be significant for supplier co-operation, and so on and so forth. This finding has common sense appeal, the motives for co-operating with suppliers and distributors often owe little to desire and more to need. It seems reasonable therefore that the antecedents to voluntary co-operation, such as competitor co-operation, will be quite different from the precursors to involuntary co-operation, such as that undertaken with distributors or suppliers. The differences between antecedents recorded for co-operation though also differ within these two categories (voluntary and involuntary). The precursors to supplier co-operation are quite different from those recorded for distributor co-operation, and so on, and so forth.

Table 7.8. - Summary of Attitudinal Antecedents to Co-operation (Uni-variate significant relationships only)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
D1	*	**		**		
D2			**			
D4	**	*	*		**	**
D5			**			
D7				*		
D8				*	*	
D10	*		*			
D11	***			**		
D15	**			**		
D18		**				
D19			**			
D22					*	
D23				**	*	

D24						*
D25					*	
D26				*		
D28	**	*		**		
D29	***	**		**		*
D30	*					
D32			*	*		
D33	*			**		**
D34				*	**	
D35		**		*		
D36			**			*
D37					**	
D38				*		
D43	**					
D45					**	
D46						
D47	*					
D48						
D49	*					

KEY:

*** = Significant at 1% level ** = Significant at 5% level * = Significant at 10% level

Table 7.8 - Summary of Attitudinal Antecedents to Co-operation (only variables shown to be significant in the logistic regression models)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
D2			•			
D4	•		•		•	
D8					•	
D11	•					
D15	•					
D18		•				
D19			•			
D22					•	
D23				•	•	
D25					•	
D29		•				
D30	•					
D33				•		
D34					•	
D35		•				
D37					•	
D45					•	
D47	•					

KEY:

• = variable included in the final model

Despite the fact there are some attitudinal variables which nearly all of the models hold in

common (for example statement D4), it would be wrong to consider co-operative antecedents in anyway which did not recognise the existence of differences between types of co-operation. Aggregating the different types of co-operation into groups such as vertical (customer, distributor and supplier) or horizontal (competitor and consultant) co-operation will simply act to mask the differences between them, and the impact of quite different attitudinal factors upon them. Future researchers should be mindful of this fact when planning their studies and designing their research instruments.

H2: Co-operative propensity is affected by the owner-manager's membership with regards to business related groups.

Results derived from the first standardised questionnaire, which was administered as part of phase one of this research, suggest that an owner-manager's co-operative propensity and their membership of business related group may be related. Tables 7.9 and 7.10 below identify the groups that were significantly related to co-operative propensity. Table 7.9 outlined uni-variate relationships, and Table 7.10 relationships which were included in the multivariate logistic regression model.

Table 7.9 - Summary of Business Group Membership and Co-operation Relationships (Uni-variate significant relationships only)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
A2A		***	***			
A2B			**			
A2C		*		*		
A2E		**		***		

KEY:

*** = Significant at 1% level ** = Significant at 5% level * = Significant at 10% level

Table 7.10 - Summary of Business Group Membership and Co-operation Relationships (only variables shown to be significant in the logistic regression models)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
A2A		•				
A2B						
A2C				•		
A2E						

KEY:

• = variable included in the final model

Evidence presented here would appear to support the alternative hypothesis (H2) that states that co-operative propensity and business club membership are interrelated. Results outlined cannot though be used to determine the direction of this relationship, so it is not possible to conclude whether individuals who join these groups have a greater propensity to co-operate than those who do not, or whether their co-operative propensity is increased through participation in these groups. Either way, the findings summarised here would appear to suggest that actors who are seeking to maximise inter-firm co-operation would be well advised to use these groups as their hunting grounds. The higher co-operative propensities (identified through both the uni-variate and multivariate analysis conducted here) displayed by individuals affiliated to these groups mean that network leaders and brokers are more likely to find and identify individuals who will be more amenable to their co-operative ideas and suggestions.

Examination of these business related groups therefore seems a logical step to take, in furthering the understanding of individuals co-operative behaviour, and it is for this reason

that business related groups, and most especially business clubs will form the sampling basis for phase two of this research.

H3: Co-operative propensity is affected by the owner-manager's demographic characteristics.

Out of all of the demographic characteristics that were included in the first standardised postal questionnaire, only one, the respondent's gender, was related to co-operative propensity. Male respondents were found to possess a higher co-operative propensity than their female counterparts, a significant relationship was identified using uni-variate analysis for respondents propensity to co-operate at both the general and competitor level. There was no multivariate evidence to suggest that such a relationship existed, though.

Only partial qualified support for a relationship between owner-manager's co-operative propensity and their demographic characteristics can be offered on the basis of this evidence. Although a relationship between respondents' gender and their co-operative propensity exists at the uni-variate level there is no support for this existence when the data is modelled using multivariate techniques. Partial support is given however, as it is recognised that the absolute number of female respondents included in the sample is small (N=19) which is not realistically a sufficient number with which to either reject or accept the null hypothesis. Partial support is therefore provided as a means of flagging up the possible relationship that may exist between the two variables. It is only through re-administration of the research instrument using a larger sample, or least one in which the number of male and female respondents are better balanced, that it will be possible to draw concrete conclusions relating to individuals sex and their co-operative propensity.

If however, the anecdotal evidence of one female owner-manager of a Devon based retail business is taken as representative, the barriers to women looking to co-operate are significant. It is therefore not surprising that women possess a lower co-operative propensity than their more fortunate male peers:

"For the 25 years that I have been in business I have felt like a woman in a mans world and this has denied MANY co-operative opportunities."

H4: Co-operative propensity is affected by the firm's demographic characteristics.

Of the five firm demographic variables included in the first questionnaire, three, the type of business which the owner-manager was running (i.e. primary, secondary or tertiary industry), the number of employees the firm retained and the county in which the organisation was based, were shown to be in anyway significant.

Uni-variate and multivariate results relating to co-operative propensity and firm demographic characteristics are given below in Tables 7.11 and 7.12 respectively.

Table 7.11 - Summary of relationships between firm demographics and co-operative propensity (Uni-variate significant relationships only)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
Bustype				***		**
County			**			
EmplovN2		*	**			*

KEY:

*** = Significant at 1% level ** = Significant at 5% level * = Significant at 10% level

Table 7.12 - Summary of relationships between firm demographics and co-operative propensity (only variables shown to be significant in the logistic regression models)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
Bustype				•		•
County			•			
EmployN2		•				

KEY:

• = variable included in the final model

Sufficient evidence has therefore been provided with which to reject the null hypothesis of no relationship, in favour of the alternative hypothesis that states that an association may well exist between respondent's firms and their relative co-operative propensities. This rejection of the null hypothesis here though, acts to underline the complexity of inter-firm relationships and factors affecting them. Relationships between variables are not always simplistic linear associations that can be interpreted with ease, rather, the evidence presented through this research programme suggests that these relationships are rarely simple ones. Once again, the findings suggest that it would be dangerous to consider co-operation *en masse*. Although a correlation may exist between one type of co-operation and businesses demographic characteristics, the same variable may be wholly inadequate as an explanatory tool for understanding actors' propensity to co-operate in another. Research approaches which consider co-operation or networking as a single entity may therefore be masking significant relationships where they exist, and identifying insignificant ones where they do not. There is then a need to accept that co-operation is a many headed beast, the in-depth understanding of which will need to be conducted on a head by head basis.

H5: An owner-manager's personality will influence their perception of co-operative success.

The final hypothesis which was investigated as part of phase one of this research sought to determine whether correlation's existed between an owner-manager's personality and their perception of the success of their co-operative activities. The failure of the DBSPI, at least as an instrument which could be relied upon to draw conclusions relating to owner-manager's personality, and its affect on their propensity to co-operate with others, means that once again it is not possible to draw any conclusions in this regard. Further discussion will therefore be confined to analysis of relationships that existed between respondent's attitudes and their relative co-operative propensities. The revised hypothesis thus reads: An owner-manager's attitudes will influence their perception of co-operative success.

Analysis of contingency tables relating to owner-manager's attitudes and variable B5_NEW, a summary, and a summary table for which has been provided earlier in this chapter, indicates that there would indeed appear to be sufficient evidence with which to reject the null hypothesis of no relationship. This finding again has significant implications for actors looking to initiate or manage co-operative relationships. If an individual's attitudes are more likely to indicate that their co-operative activities have been successful, network brokers, leaders and initiators may use this knowledge to achieve their own ulterior motives. For network brokers, job security may be dependent on generating a given number of networks or co-operative groups. Although, these groups may be perceived as being successful by their members, they may in fact, fail to achieve the objectives set by the brokers public sector employers. It is therefore possible that where brokers have an explicit or intuitive awareness of the types of individual who are perhaps predisposed to viewing their co-operative activities as being successful, government

funding objectives be they defined in terms of job creation or general local economic development will not be achieved.

Discussion of the five hypotheses measured as part of the first phase of this research programme, and results relating to them, has indicated that sufficient support exists to at least partially accept all of the alternative hypotheses presented. The next chapter considers results derived from the second phase of this research, and closes, as this chapter has with a re-presentation and discussion of relevant hypotheses (the remaining hypotheses, six to ten are considered).

Chapter Eight - Phase Two Results and Discussion

8.1 Introduction

The following chapter analyses results derived from the second standardised postal questionnaire. Although results were collected from nine separate business clubs and trade associations responses have for the most part been aggregated here in order that the more complex statistical analyses such as logistic regression can be used, and their results be viewed as meaningful. The data are analysed and produced here in much the same way as in the preceding chapter. Frequency tables for data collected in phase two are presented in Appendix X. Significant relationships between key variables (such as the network to which the respondent is affiliated and the perceived level of success that the network has enjoyed) and the level of trust, commitment, communication and macro-environmental factors are then discussed. Significant variables are then entered into a logistic regression model which is extended as a means of predicting network success. The chapter closes with a summary and discussion of the principal research findings and their implications for current and future network theory and research.

8.2 Significant Relationships

Respondents' attitudinal, behavioural and demographic variables were cross-tabulated against three key variables: "Network" (the network to which the respondent was affiliated), B7_NEW (the original B7 variable which scored respondents perception of co-operative success within the network was recoded so as to reduce the number of cells with frequencies of less than five), and C5_NEW (which recoded the original C5 variable which was used to assess respondents perception of the success of their co-operative activities as

a whole). The null hypothesis was tested using appropriate chi-square significance tests. Pearson's chi-square was used predominantly, but where the cross-tabulated variables resulted in a two by two contingency table Yates continuity correction was employed, and where the same tables resulted in a number of low values Fisher's exact probability test was used in its place.

Significant relationships (i.e. those for which there are *prima facie* grounds for rejecting the null hypothesis of no relationship) are summarised in tables 8.1, 8.2 and 8.3.

Table 8.1 – Chi-square Results Summary for Listed Variables by the Respondent's 'Network' (significant variables only)

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
Q1	16	0.892	14 of 27 (51.9%)	12	0.02945
Q2	16	0.693	14 of 27 (51.9%)	15	0.00010
Q6	16	0.356	18 of 27 (66.7%)	0	0.01043
Q7	16	1.162	10 of 27 (37.0%)	0	0.00006
Q10	16	1.665	13 of 27 (48.1%)	26	0.00321
Q11	16	0.484	15 of 27 (55.6%)	5	0.4401
Q12	16	0.312	16 0f 27 (59.3%)	3	0.9542
Q13	16	1.298	11 of 27 (40.7%)	8	0.00044
Q14	16	1.576	16 of 27 (59.3%)	55	0.00001
Q15	16	1.067	14 of 27 (51.9%)	73	0.00071
Q16	16	0.794	16 of 27 (59.3%)	64	0.00039
Q17	16	0.443	13 of 27 (48.1%)	9	0.00033
Q18	16	0.750	14 of 27 (51.9%)	45	0.00052
Q20	16	1.249	13 of 27 (48.1%)	56	0.03502
Q21	16	0.149	15 of 27 (55.6%)	11	0.01147
Q22	16	0.480	16 of 27 (59.3%)	28	0.02058
Q24	16	0.137	15 of 27 (55.6%)	19	0.04795
Q25	16	0.097	15 of 27 (55.6%)	5	0.00017
Q26	16	0.622	14 of 27 (51.9%)	12	0.01386
Q27	16	0.949	14 of 27 (51.9%)	19	0.00185
Q28	16	0.884	11 of 27 (40.7%)	29	0.00248
Q29	16	1.371	13 of 27 (48.1%)	16	0.00000
Q30	16	1.282	14 of 27 (51.9%)	19	0.00143
Q31	16	1.039	11 of 27 (40.7%)	22	0.00000
Q32	16	0.548	16 of 27 (59.3%)	23	0.00003
Q34	16	0.389	17 of 27 (63.0%)	37	0.00129
Q35	16	0.726	15 of 27 (55.6%)	38	0.00387
Q36	16	1.422	16 of 27 (59.3%)	42	0.00018
B1	408	0.024	461 of 468 (98.5%)	5	0.00000
B2	8	0.464	9 of 18 (50.0%)	20	0.00000
B3A	16	0.025	16 of 27 (59.3%)	11	0.00000
B3B	16	0.083	20 of 27 (74.1%)	84	0.00011
B5A	40	0.023	44 of 54 (81.5%)	33	0.00209
B5C	32	0.024	35 of 45 (77.8%)	43	0.07883

B6A	136	0.016	154 of 162 (95.1%)	63	0.00000
B6B_I	30	0.007	37 of 42 (88.1%)	105	0.00000
B6B_II	84	0.006	100 of 105 (95.2%)	97	0.00003
B6B_III	70	0.006	83 of 88 (94.3%)	98	0.00000
B6B_IV	63	0.007	75 of 80 (93.8%)	101	0.00000
B7	12	0.243	12 of 20 (60.0%)	146	0.02500
C5	32	0.060	36 of 45 (80.0%)	53	0.00209
C7	6	0.772	6 of 12 (50.0%)	117	0.00672
C8	12	0.573	11 of 20 (55.0%)	122	0.00000
D1	40	0.025	42 of 54 (77.8%)	10	0.00000
D4_YEAR	448	0.019	506 of 513 (98.6%)	37	0.00061
D4_TURNO	72	0.064	73 of 90 (81.1%)	18	0.00000
D5	88	0.052	99 of 108 (91.7%)	21	0.00004
D6	48	0.023	50 of 63 (79.4%)	31	0.00002
D7_AGE	32	0.061	29 of 45 (64.4%)	9	0.00001
D7_SEX	8	1.755	4 of 18 (22.2%)	8	0.00000
D7_LOCAT	296	0.020	334 of 342 (97.7%)	9	0.00000
D7_POSIT	8	0.214	10 of 18 (55.6%)	19	0.00102
D8	3	0.647	4 of 8 (50.0%)	114	0.00000
B7_NEW	3	5.710	-	146	0.07796
C5_NEW	6	2.464	6 of 14 (42.9%)	141	0.02276

A number of caveats should be identified in relation to these results before any further analysis or discussion can reasonably be undertaken. Firstly it should be noted that for all relationships identified in Table 8.2, without exception the expected cell frequency is less than five in over twenty percent of the cells reported in the original contingency tables. In many cases the number of cells with an expected frequency of less than five is substantially higher than the twenty percent level which is conventionally seen as the maximum acceptable threshold. In some instances the number of cells with an expected frequency of less than five is approaching one hundred percent.

Variables A1 to A36 have been recoded as far as is reasonably possible, any further aggregation of these variables would have succeeded only in producing unreliable or meaningless data. By way of example data reported in Table 8.2 summarises contingency tables calculated for respondents network affiliation against their attitudes towards and behaviour within these networks. Reclassifying the "network" variable is inappropriate, as

aggregation of this variable would be entirely subjective. The attitudinal and behavioural variables (A1-A36) have been recoded however, so as to minimise the number of cells that their variable requires in resultant tables. The original six options that were available to respondents were thus reduced to three. The original six options: "strongly agree", "agree", "neither agree / disagree", "disagree", "strongly agree" and "do not know" were thus recoded into: Agree (strongly agree and agree), neither agree or disagree (original value), and disagree (disagree and strongly disagree). Responses from individuals who indicated a "do not know" position were recoded as missing variables. Any further aggregation beyond this level, as was the case with the network variable would be meaningless. Recoding of other variables is discussed where relevant.

"Network" Relationships

Networks were found to vary significantly from one to another in terms of their members' responses to a number of key factors. It should be noted though, that significant variations are not evident for all variables. Those which were not found to be significant, or which needed to be recoded before being considered are considered in the discussion section that closes this chapter.

As was the case with the first questionnaire (which was discussed in Chapters Six and Seven) a significance level of ten percent has been used to conduct the chi-square analysis detailed below. Once again the high number of attitudinal / personality related variables make this an acceptable practice.

The results derived from cross-tabulating the "Network" and "Statement A1" variables

demonstrates significant differences between the networks in terms of their likelihood of co-operating with competitors operating within similar geographical markets (p. <0.05). Members of the UK200 accountancy group stated that they were much more likely to co-operate with other members if they were not operating within the firm's own market. For other groups such as the Alliance of Business Consultants and the PPS Hotel and Guesthouse group competitor proximity was not an issue.

The degree to which members felt they shared a lot in common (statement A2) also varied widely between networks (p. <0.01). Substantially more respondents than expected for the Mayflower Produce, UK200, Business Breakfast Club and Women in Business networks, indicated that they had a lot in common with other members of the group. The opposite was found to be the case for affiliates of the Plymouth and District Hotel, Guesthouse and Restaurant, PPS Hotel and Guesthouse, Cardiff and Vale Business Centre and Alliance of Business Consultants networks.

Perceptions of market competitiveness (statement A6) also varied widely between groups (p. <0.05). For most of the sampled groups the number of respondents who indicated that the market in which they operated was highly competitive exceeded the expected value. The only exceptions to this rule were the Women in Business and Alliance of Business Consultants Groups where the "agree / strongly agree" position was underrepresented and the "neither agree / disagree" and "disagree / strongly disagree" positions exceeded expected values.

A respondent's likelihood of communicating regularly with other members of their network was also related to the network to which they were affiliated (p. <0.01). Members of the PPS Hotel and Guesthouse, Devon Choice Holiday, Mayflower Produce and UK200

Groups were all found to communicate with one another more frequently than was anticipated. For the Plymouth and District Hotel, Guesthouse and Restaurant, Cardiff and Vale Business Centre and Women in Business networks the opposite was true.

Variation from the null hypothesis of no relationship was also noted for statement A10 where analysis reveals that the benefits realised by the network were not perceived as being divided fairly between members for all of the sampled groups ($p < 0.01$). Benefits were generally viewed as being fairly distributed within the PPS Hotel and Guesthouse, Devon Choice Holiday, Mayflower Produce and Business Breakfast Club networks. In contrast benefits were viewed as not being fairly allocated by members of the Plymouth and District Hotel, Guesthouse and Restaurant, UK200 and Alliance of Business Consultants groups.

Respondents' perceptions of their market's tendency towards volatility (statement A11) understandably varied from network to network ($p. < 0.05$). This is in line with expectations and demonstrates the diversity of the sample in this phase of the research, thereby achieving one of the key research objectives. Higher than expected frequencies for the individuals who were not prone to rapid market change were recorded for Devon Choice Holidays, Cardiff and Vale Business Centre and Women in Business. Groups in which a substantial number of respondents indicated an opposing view were limited, only the Plymouth and District Hotel, Guesthouse and Restaurant, and the Alliance of Business Consultants groups are notable in this way.

The degree to which network communications could be said to be formal (statement A12) varied widely between the groups ($p. < 0.1$). Informal communication was favoured in the Plymouth and District Hotel, Guesthouse and Restaurant, PPS Hotel and Guesthouse, Devon Choice Holidays and Women in Business networks, whereas the opposite was true

for members of the UK200. It should however be recognised that in the case of the UK200 group substantially more respondents selected the neither agree or disagree position than chose the disagree-strongly disagree position. Coupled with the fact that over two thirds of the groups members felt that communications were informal it would therefore be wrong to suggest that they were not.

Not all respondents felt that they trusted network members more than other business people they dealt with (statement A13). Once again the degree to which network members were prepared to trust one another varied significantly between the networks (p. <0.01). Poor levels of intra-network trust were evident within the Plymouth and District Hotel, Guesthouse and Restaurant, PPS Hotel and Guesthouse and the Cardiff and Vale Business Centre. In contrast higher than anticipated levels of trust were recorded for Devon Choice Holidays, Mayflower Produce and the UK200 groups.

Results derived from cross-tabulating respondents' network membership with statement A14 (Large firm members contribute proportionately more money and resources than their smaller counterparts) as expected reflect the diverse range of networks sampled. If this hypothesis were proved to be true one would expect to see agreement with this statement only where the network under investigation was known to possess large or larger firms, as is the case for the Mayflower Produce and UK200 groups. Indeed this proved to the case, with networks which were known to include large firms (namely the UK200 and Mayflower Produce groups) indicated that these larger firms paid proportionately more towards network maintenance than their smaller counterparts. Results from those groups in which larger firm members were not known to exist, did not vary significantly from expected values (p. <0.01).

Inter-network variation was also evident in members responses to statement A15 (All network members were in agreement at the outset, as to what the objectives of the network should be) (p. <0.01). Higher than expected numbers of respondents from PPS Hotel and Guesthouse, Devon Choice Holidays Mayflower Produce and The Business Breakfast Club groups indicated that members were in agreement on objectives at the outset. At the other end of the scale (disagreement) members of the Plymouth and District Hotel, Guesthouse and Restaurant, and Alliance of Business Consultant groups were all over-represented. This result perhaps reflects the relative ages of the networks studied. Younger networks such as the Devon Choice Holiday group could reasonably be expected to possess a higher proportion of their original members than their older counterparts. As a result they would be more likely to contain members who felt better positioned to comment on whether members were in agreement on network objectives when the group was established.

Respondents' reactions to the statement – "Conflict between members is rare" (statement A16) varied significantly between networks (p. <0.01). The Devon Choice Holiday and The Business Breakfast Club groups were unique in that none of their members (at least not those who felt able to provide a response) indicated anything other than agreement with the statement. Conversely one finds the levels of disagreement recorded for Plymouth and District Hotel, Guesthouse and Restaurant and the PPS Hotel and Guesthouse groups was substantially higher than those expected.

Contingency table results also indicate that respondents' trust in other members of their network has not always increased over time. Once again, significant differences in terms of members response to statement A17 were recorded for each of the networks studied (p. <0.01). Interpersonal trust was found to have increased more than expected for members of the UK200 and the Business Breakfast Club groups. Increases in trust over time were

not however evident for all of the networks, however. Taking the Plymouth and District Hotel, Guesthouse and Restaurant group as an example, one finds that none of its members felt able to indicate agreement with the statement.

Network costs like benefits (statement A10) are not always split fairly within the networks studied (statement A18). In some networks more members than expected believe that costs are divided fairly (e.g. The Business Breakfast Club and the Alliance of Business Consultants), whilst in others respondents believe that cost division is anything but fair (e.g. Plymouth and District Hotel, Guesthouse and Restaurant and UK200).

Significant variation between networks was also evident in analysis of statement A20 (All views and opinions are expressed and discussed before any decision is made) ($p. <0.05$). The greatest proportion of members disagreeing with this statement were to be found in the Plymouth and District Hotel, Guesthouse and Restaurant and PPS Hotel and Guesthouse groups.

In response to the statement – "I believe that network members as a whole are sincere and honest" (statement A21) one finds once again variance in terms of the answers given by each network ($p. <0.05$). For the Plymouth and District Hotel, Guesthouse and Restaurant group less than fifty percent of the expected number of respondents felt able to pledge fellow member's honesty in this way. Similar, but less marked variations are evident for the other networks.

Respondents' perceptions of other members' time and resource commitment (statement A22) varies from group to group ($p. <0.05$). For some networks (e.g. UK200, Women in Business and Alliance of Business Consultants) a higher number of members than

anticipated, were believed to be committing a negligible quantity of either time or resources. For other groups the number of respondents indicating disagreement with the statement exceeded their expected values.

Reactions to the statement "I would be more inclined to co-operate if competition were more intense" (statement A24) were once again mixed (p. <0.05). The most notable variation was recorded for the Women in Business network where nearly twenty five percent more members than expected indicated that they would not be more inclined to co-operate if competition were more intense. A number of smaller variations away from expected values were recorded for the other networks.

The relationship between the network to which a member was affiliated and their response to statement A25 'Network members are friendly and approachable' was found to be significant at the one percent level. Variation between observed values for agreement with the statement and expected values were at their most marked for the Women in Business and Business Breakfast Club networks. Minor variations between observed and expected values were also recorded for a number of networks at the other end of the scale (disagreement). The midpoint of "neither agree / disagree" however was perhaps the area in which greatest variation was evident, as is illustrated by the fact that observed values exceeded expected values by nearly four fold for both the Plymouth and District Hotel, Guesthouse and Restaurant and Cardiff and Vale Business Centre groups.

Significant differences between the networks were evident through analysis of the contingency table "A26" by "Network" (p. <0.05). Although variances from expected values are evident for all of the networks, the most marked of these variations occurred for the UK200 group where the observed value for agreement with the statement ("I place the

greatest trust in those members with whom I have had the most contact in the past") exceeded the expected value by nearly twenty five percent.

Views on statement A27; "All members of the network are working for collective as opposed to individual gain" were mixed, with significant differences between the networks being identified at the one percent level. The most notable variances from expected values are to be found for the Devon Choice Holiday group where over four times the expected number of respondents indicated agreement with statement A27, and the Alliance of Business Consultant network, where none of its members felt able to do so.

Reactions to the statement "The group rarely makes decisions that go against my wishes" (A28) were once again mixed ($p. < 0.01$). Although minor deviations from expected values were evident throughout the contingency table it was difficult to identify any instances in which observed and expected value differences were notable.

For statement A29 where respondents were asked explicitly whether they trusted other members to make important decisions which affected their firm when they themselves were unable to make those decisions, there is a highly significant relationship between network membership and statement response ($p. < 0.01$). The most obvious variations from expected values were recorded for the Women in Business group, where more members than anticipated disagreed with the statement (nearly twice as many), and the UK200 where nearly fifty percent more members than expected were prepared to trust other members, even with important decisions.

Views on whether all members of the network were equally committed to the success of the network (statement A30) varied between groups ($p. < 0.01$). For some networks such as

Devon Choice Holidays, far more respondents than expected believed that members were committed to the groups success. For others such as the Alliance of Business Consultants group the opposite was true.

When respondents were asked whether a single member's personality or objectives dominate the group (statement A31) significant differences were found in responses between the networks studied (p. <0.01). In the case of the UK200 group for example, over twice as many respondents than expected believed that a single individual's personality or objectives did dominate the group. A similar proportion of Mayflower Produce and Business Breakfast Club respondents held a contrary view.

Deviation from expected values was also recorded when the "Network" variable was cross-tabulated against statement A32 (Network meetings are rarely arranged, and when they are, are poorly attended). Pearson's chi-square statistic was valid at the one percent level, once again indicating that a relationship may exist, and that there are reasonable grounds for questioning the null hypothesis of no relationship. However, this statement effectively comprises of two statements, consequently results derived from it should be treated with caution.

The existence of a relationship between the "network" and A34 variable ("No single individual uses their firm's power in terms of market share, turnover, etc. to dominate the group") would appear to suggest that there are power differentials between networks (p. <0.01). Higher than expected levels of disagreement (i.e. a prevailing belief that a single individual did use their firms power to influence the group) were identified for the Plymouth and District Hotel, Guesthouse and Restaurant and PPS Hotel and Guesthouse groups. Conversely, higher than expected levels of agreement were recorded for the

Business Breakfast Club, Women in Business and Alliance of Business Consultant groups.

Reactions to the statement that "The network has members who are seeking to exploit other members in what ever way they can" were once again mixed. A relationship between the "Network" and A35 variable was significant at the one percent level. Disagreement with the statement was higher than expected for the Mayflower Produce and UK200 groups, and lower than expected for Cardiff and Vale Business Centre and Alliance of Business Consultant networks. Other less substantial variations for the other groups were evident throughout the table.

Commitment in terms of a readiness to make personal sacrifices if such sacrifices benefited the network as a whole, also varied in line with network affiliation (statement A36) (p. <0.01). A higher level of communitarian behaviour was recorded for members of Devon Choice Holiday and Mayflower Produce networks. More Machiavellian behaviour was evident for members of the Plymouth and District Hotel, Guesthouse and Restaurant and PPS Hotel and Guesthouse, and Women in Business groups.

Variances between networks were also evident for individual's responses to the question: "Network co-operative activities could best be described as – non legal agreement or legal contracts" (B2). Higher than expected numbers of formal relationships were recorded for Devon Choice Holidays and the Mayflower Produce networks. Lower than expected numbers of informal relationships were recorded for all other networks (p. <0.01).

Analysis of the contingency table relating to variables "B3A" (Does the network possess a clear leader?) and "Network" indicated that there would appear to be a relationship between the two (p. <0.01). Some networks such as the PPS Hotel and Guesthouse,

UK200 and Business Breakfast Club had higher than expected numbers of respondents indicating that the group had a clear leader, whilst others like Devon Choice Holidays, Cardiff and Vale Business Centre and the Alliance of Business Consultants indicated that the network did not have a clear leader.

Variations in response between network were once again noted when members were asked whether their leader had been effective (B3B) ($p. <0.05$). For some networks such as the UK200 group higher than expected numbers of respondents indicated that their leader had been effective, whilst for other groups such as the Business Breakfast Club the opposite was true. Some minor recoding of the original variable B3B was completed before the reported analysis was conducted, as at the data input stage responses had been entered into three categories ("yes", "no" and "no with a comment"). As no additional advantage was to be derived from cross-tabulating the network and B3B variable with a distinction for whether comments were volunteered or not, the B3B variable was aggregated into two categories, "yes" and "no". The resulting variable is subsequently referred to as "B3B_NEW".

Recoding of the original variable was also required for question B6A: "How much of the following has your company invested in co-operative activities (a) money as a percentage of annual turnover?" Responses recorded for the original variable (B6A) ranged from zero to ten percent. Analysis of the cumulative frequency column for this variable identified the following groups: "0%", "> 0 < 0.5%", "0.51-1.0%" and "> 1.0%". The recoded variable (B6A_NEW) identified a significant correlation between network membership and commitment to co-operative activities (measured in monetary terms) ($p. 0.01$). This commitment can be demonstrated by the fact that members of some groups such as the UK200 group committed more of their turnover to co-operative activities than expected,

whilst others such as those who were affiliated to the Women in Business group commit less.

Similar recoding of the original variable was required for variables B6B I to IV. Once again cumulative frequency scores were used as a means of deriving meaningful representative categorical data from the continuous data provided. Three categories were employed for each of the four variables: "0%", "> 0 < or = 1.0%" and ">1.0%". For all four variables which were used to measure resource commitment: (i) manufacturing capacity, (ii) labour force, (iii) fixed overheads and (iv) variable overheads, a relationship was found to exist at the one percent level, indicating once again that differences existed between the networks studied.

A recoded version of the B7 variable (respondent's perception of network success) was, understandably found to be related to network affiliation (p. <0.05). The original five categories were aggregated into three: "Highly successful / successful", "Neither successful / unsuccessful" and "Unsuccessful / Highly unsuccessful". The resulting new variable was labelled: "B7_NEW". Further recoding of the original B7 variable was conducted in preparation for subsequent multivariate analysis. As logistic regression was the favoured tool for analysis a dichotomous dependant variable was required. Consequently the five groups contained in the B7 variable and the three present in the B7_NEW variable were unworkable. The dilemma in recoding data for this purpose is in where one should divide the data. The problem is exacerbated when there is an odd number of points on the scale being used to collect the data (as is the case with the five point Likert scale used here), and where the mid-point on the scale represents indecision on the part of a respondent. Such a divide will in almost all cases be an artificial one. In the case of the B7 variable discussed here a decision was made to draw a distinction between successful and unsuccessful

networks. Difficulty then arose in classifying the neither successful or unsuccessful responses. As the objective of the research outlined here though was to determine which variables positively affected network success, "neither successful or unsuccessful" responses were classified in the unsuccessful category of the new variable. This new dichotomous B7 variable is referred to hereafter as "B7_LOG_R".

It should be noted that the B7 variable was only added to the questionnaire during the later stages of phase two data collection, when it was recognised that item C5; (Looking at your co-operative activities as a whole, please indicate the level to which they have been successful in achieving the objectives set for them) represented an imperfect tool for collecting information on network success. Its inadequacy rests in the fact that network success and the success of co-operative activities as a whole, are clearly not mutually exclusive. As a means of rectifying this fault variable B7 was added to the questionnaire. Due however to its late inclusion in the survey, data for this item could only be collected for the Cardiff and Vale Business Centre, Business Breakfast Club, Women in Business and Alliance of Business Consultant networks.

Variable C5 (Looking at your co-operative activities as a whole, please indicate the level to which they have been successful in achieving the objectives set for them) was recoded for the same reasons and along the same lines as the original B7 variable. The resultant variables were labelled C5_NEW (five to three categories) and C5_LOG_R (dichotomous). Once again significant differences between observed and expected values were evident, with individuals' perceptions of the success of their co-operative activities being related to the network to which they were affiliated ($p. < 0.05$). By way of example one finds that observed values for the "highly successful / successful" position exceed expected values for members of the Mayflower Produce, Women in Business and Alliance of Business

Consultants networks.

Individuals were also found to differ in terms of their response to question C7 (If presented with a choice, which sex would you prefer to co-operate with?), a significant relationship was found to exist between the C7 and "Network" variables (p. <0.01). The only notable variations from expected values were the Women in Business group, where a higher proportion of members indicated they would rather co-operate with women, and the Alliance of Business Consultants where a higher number of respondents indicated that they would rather co-operate with men.

A relationship was also found to exist between the respondents' preferred gender for their co-operative partners (C7) and the extent to which their co-operative activities were dominated by members of that gender (C8) (p. <0.01). In order that the number of cells with a frequency of less than five could be minimised it was necessary to recode the C8 variable from a five to three point Likert scale. The new categories used were: "more men than women", "approximately equal" and "more women than men". In line with expectations it was found that respondents who indicated that they would prefer to co-operate with women possessed personal networks which were dominated by women (the observed value here was nearly three times the expected value), whereas individuals who indicated that they would rather co-operate with men possessed personal networks which were dominated by men (the observed value here was over two times greater than the expected value).

A correlation was also noted between respondents preferred gender for co-operative relationships (C7) and their own sex (p. <0.01). One finds that males would rather co-operate with other males, whilst the opposite is true for their female counterparts. It should

be noted however, that the cell frequency levels in contingency tables reported for C7 by "Network", C7 by C8_NEW, C7 and D7_Sex and C8 by "Network" are all low. As with the B7 variable reported above, this is attributable to the late inclusion of the C7 and C8 variables in the questionnaire. The results derived are therefore based on responses from members of the Cardiff and Vale Business Centre, The Business Breakfast Club, Women in Business and Alliance of Business Consultants networks to whom the survey was administered in the later stages of data collection.

Examination of the contingency table for the recoded C8 variable (C8_NEW) and the "Network" variable reveals the presence of a relationship between network membership and the extent to which a respondent's co-operative activities could be said to be dominated by one sex or the other ($p. < 0.01$). Members of the Cardiff and Vale Business Centre and Alliance of Business Consultant groups for example possessed personal networks which were comprised of a higher number of males than expected, whilst members of the Women in Business group possessed personal networks with a higher number of female co-operative partners.

One of the explanations for the number of significant relationships between variables discussed here and network membership rests perhaps in the markets the networks were seeking to serve. A correlation between the "Network" and D1 (In which markets is your firm currently competing Local, regional, national or international?) would appear to suggest that the market supplied and the network to which an individual is affiliated were interrelated variables ($p. < 0.01$). The tourism-driven networks (Plymouth and District Hotel, Guesthouse and Restaurant, PPS Hotel and Guesthouse and Devon Choice Holiday) all displayed higher than expected observed values for national and international markets, and lower than expected observed frequencies for local and regional markets. The reverse

situation was evident for members of the UK200 group. Once again some minor recoding of the original D1 variable was necessary before analysis could be conducted. Responses to the D1 variable that were not originally coded into the four available categories (of which there were two) were labelled as system missing responses. The resulting variable (D1_NEW) was used for this and subsequent analysis.

Similar recoding of the original variable was required for D4_YEAR, D4_TURNO, D5 and D6. In all cases the data was aggregated as a means of reducing the number of cells in the table (for example, in the original D4_YEAR by "Network contingency table there was over 513 cells) and as a result the number of cells with a frequency of less than five.

A significant relationship was found to exist between the "Network" and D7YEAR_N variables ($p. <0.01$). The existence of this relationship goes some way towards explaining many of the other relationships between the "Network" variable and other variables reported here. The existence of heterogeneous behavioural patterns in a network comparative study of this type is hardly surprising when one realises the extent to which firm demographics differ between these groups. For example the Women in Business and Alliance of Business Consultant networks contained a higher number of young firms, (i.e. those that had been in business for one year or less, or one to three years firms), than expected, whereas the opposite is true for the UK200 and Mayflower Produce groups, where a higher proportion of members than expected had been in business for ten years or more.

Further analysis of demographic information relating to these groups goes even further towards providing an explanation for the existence of so many relationships with the "Network" variable. The significant relationship between the revised D4 turnover

(D4TURN_N) and "Network" variable (p. <0.01) would appear to shed further light on why the networks studied here are so different in terms both of the success they achieved and the way that their members behaved. Membership of these networks in demographic terms would appear to be largely homogeneous. For example, one finds that a higher number of firms affiliated to the Plymouth and District Hotel, Guesthouse and Restaurant, PPS Hotel and Guesthouse, Women in Business and Alliance of Business Consultant than expected have a turnover of less than one hundred thousand pounds per annum. Conversely, a higher than expected proportion of members of the UK200 and Cardiff and Vale Business Centre networks have annual turnovers in excess of one hundred thousand pounds. Profit variances between networks were also identified (D6_NEW by "Network") (p. <0.01). Some networks possessed a higher than expected number of members who enjoyed profits in excess of thirty percent of turnover (e.g. the Alliance of Business Consultants), whilst others had higher than expected numbers who had to accept more modest profit margins, or even positions in which they were merely breaking even (e.g. the Business Breakfast Club and Women in Business groups).

Network differentials were also evident in terms of the proportion of the annual turnover which members could attribute to network membership (D5_NEW by "Network") (p. <0.01). A higher than expected number of respondents from the Women in Business group derived no extra profits from membership, whereas a higher proportion of members from the Mayflower Produce and Alliance of Business Consultants networks relied on their group for over twenty percent of their annual turnover.

Respondent firms were also found to vary by network in terms of the type of business which they were in (p. <0.01). For example a lower proportion of members of the Cardiff and Vale Business Centre network than expected indicated they were active in the service

sector, whilst a lower number of members than expected from the Women in Business and Alliance of Business Consultants networks operated in the manufacturing sector.

Again there appears to be a relationship between network membership and the location of the respondent's business (D7_LOCAT) (p. <0.01). This is of course to be expected, given that all of the networks without exception are regionally based. The presence and significance of this relationship does however serve to demonstrate the validity, albeit indicative validity, of other contingency table analysis conducted as part of this research programme. It does so by emphasising the fact that a relationship should not be discarded from analysis simply because the number of cells with a frequency of less than five exceeds the conventional maximum level of twenty percent.

In terms of respondents' own demographic profile, significant differences were found between the networks for all three of the chosen characteristics: age (p. <0.01), sex (p. <0.01) and respondent's position within their firm (p. <0.01). Some networks such as the Plymouth and District Hotel, Guesthouse and Restaurant, Cardiff and Vale Business Centre and Business Breakfast Club groups were represented by a higher than expected number of managers, whilst others such as the UK200 group were represented by a higher than expected number of owner-managers. Some of the groups studied were clearly dominated by members of one sex or the other. The Women in Business group was understandable comprised solely of women, whilst the Alliance of Business Consultants network was comprised entirely of men. In terms of the respondent's age one found that members of the Alliance of Business Consultants had a higher than expected number of older members, whilst the Women in Business and Cardiff and Vale Business Centre groups had a higher than expected number of younger members.

Recoding of potentially significant variables

Further recoding of variables A1 to A36 is not possible beyond the level to which it has already been conducted. As has already been indicated at length further aggregation of the data for these statements beyond their existing level of "agree", "neither agree / disagree" and "disagree" would be meaningless, and analysis of results derived in this way pointless. This argument is not valid however for some of the other variables included in the questionnaire. It is to these non-Likert based variables that the reader's attention is now turned.

Question B1: "How long have you been a member of the network / co-operative group" collected individual's responses in the form of continuous data (number of years or months); there was therefore scope for recoding information collected in this way into a meaningful categorical form. Re-classifying the data in this way made it possible to determine whether the relationship identified through initial cross-tabulation of the "Network" and "B1" variables was significant, as was suggested by the Pearson's chi-square statistic for the initial analysis (p. <0.01). An examination of the cumulative frequency column for variable "B1" identified the following categories: "12 months or less", "13 to 24 months", "25 to 36 months", "37 to 60 months" and "61 months or more". These categories were then used to determine whether a relationship between the network and length of membership variable could be supported ("Network" by "B1_NEW"). The net result of reclassifying the data in this way was a drop in the number of cells with a frequency of a less than five, from 98.5% to 66.7% (although traditionally a relationship will only be accepted if cell frequency is less than five in 20% of the cells (or less). An improvement in this direction could only increase the indicative validity of such a result. Relationship significance remained unchanged, with the Pearson's chi-square statistic

indicating that such a relationship would occur by chance in considerably less than one percent of cases.

Surprisingly, the number of hours members spent developing new contacts or maintaining existing co-operative relationships did not differ significantly from one network to another. Analysis of the cumulative percentage column of the original contingency table however, indicated the existence of five clear categories for both of these variables. Given that some variability between the networks in terms of C1 and C2 was expected, a decision was made to recode the data (if appropriate) and rerun the significance test to determine whether a relationship could be said to exist or not. Although the percentages recorded for variable C1 and C2 differed slightly between the two, these five categories were the most obvious groups for both: "<1 hour" (30.9% and 25.0% percent respectively); ">1<2 hours" (47.5% and 50.9% percent respectively); >2< or = 4 hours" (75.1% and 75.9% percent respectively); "4.1 – 5 hours" (84.3% and 85.6% percent respectively) and ">5 hours".

As a result of the recoding, it is evident that the C1 variable (number of hours spend developing new contacts) is significant (p. < 0.01) but that the C2 variable (number of hours spent maintaining existing co-operative relationships is not (p. = 0.27588). From this result it is possible to make the tentative conclusion (as once again cell frequency levels are less than five in over twenty percent of the tables cells) that networks differ from one another significantly in terms of the number of hours they spend cultivating new co-operative relationships, but not in terms of the number of hours they spend maintaining old ones. This result probably reflects the fact that for the most part the networks were low intensity groups, that is to say membership of them did not generally necessitate heavy time investments. The markets in which the firms sampled competed and the products or services they provided were quite different. In more competitive or faster moving markets

the need to establish new co-operative relations is likely to be higher. Extensive and proactive co-operative relationships in these markets could therefore be better classified not as a potential source of competitive advantage, but as a necessary mechanism for survival.

Recoding of variables B5A, B5B and B5C also proved to be a necessary means of increasing cell frequency levels for contingency tables relating to these variables. Through analysis of the frequency tables relating to these variables, the following new categories were selected: B5A and B5B – "Increase of 11% or more", "Increase of 1-10%", "No change" and "Decrease of 1% or more". As none of the respondents indicated a decrease in market share as a result of co-operation, only three categories were necessary for classifying the B5C variable: "Increase of 11% or more", "Increase of 1-10%" and "No change".

Table 8. 2 – Summary of Contingency Tables for Recoded Variables by the Network Variable

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
B1_NEW	32	0.919	30 of 45 (66.7%)	5	0.00000
B3B_NEW	8	0.237	10 of 18 (55.6%)	84	0.04492
B6A_NEW	24	0.411	22 of 36 (61.1%)	63	0.00000
B6BI_NEW	12	0.014	16 of 21 (76.2%)	105	0.00000
B6BII_NE	12	0.135	10 of 21 (47.6%)	97	0.00002
B6BIII_N	14	0.045	19 of 24 (79.2%)	98	0.00000
B6BIV_NE	14	0.046	19 of 24 (79.2%)	101	0.00000
B7_NEW	6	1.458	4 of 12 (33.3%)	146	0.01488
C5_NEW	16	0.300	17 of 27 (63.0%)	53	0.01267
D1_NEW	24	1.295	24 of 36 (66.7%)	12	0.00000
D4YEAR_N	24	0.759	23 of 36 (63.9%)	37	0.00000
D4TURN_O	48	0.225	45 of 63 (71.4%)	18	0.00000
D5_NEW	24	0.466	24 of 36 (66.7%)	21	0.00000
D6_NEW	32	0.271	32 of 45 (71.1%)	32	0.00000
D7AGE_N	24	0.389	20 of 36 (55.6%)	9	0.00000

Table 8. 3 – Summary of Contingency Tables for Recoded Variables not cross-tabulated against the Network Variable

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
C8NEW by C7	4	1.389	4 of 9 (44.4%)	122	0.00021
C7 by D7_SEX	2	3.474	2 of 6 (33.3%)	118	0.00071

The following table summarises results derived from cross-tabulating the recoded perceived network success variable (C5_LOG_R), against network attitudinal variables A1-A36, demographic data and other pertinent information for which a relationship might reasonably be anticipated.

Table 8.4 – Chi-square Results Summary for Listed Variables by 'B7_LOG_R' (significant variables only)

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
A2	2	6.252	-	150	0.07744
A7	2	9.224	-	146	0.00116
A10	2	11.011	-	159	0.03155
A11	2	1.769	2 of 6 (33.3%)	149	0.04434
A13	2	9.216	-	151	0.00635
A14	2	2.838	2 of 6 (33.3%)	179	0.00951
A15	2	6.513	-	177	0.01524
A16	2	2.405	2 of 6 (33.3%)	174	0.00589
A18	2	1.931	2 of 6 (33.3%)	166	0.00770
A21	2	0.893	3 of 6 (50.0%)	150	0.01590
A25	1	4.924	1 of 4 (25.0%)	148	0.00091
A26	2	4.099	2 of 6 (33.3%)	152	0.01453
A27	2	4.694	1 of 6 (16.7%)	155	0.08689
A28	2	2.935	2 of 6 (33.3%)	161	0.00386
A30	2	8.969	-	157	0.03075
A34	2	0.956	2 of 6 (33.3%)	163	0.01941
B5A	4	0.404	6 of 10 (60.0%)	154	0.00000
B5B	4	0.416	6 of 10 (60.0%)	152	0.00011
B5C	4	0.392	7 of 10 (70.0%)	156	0.01548
B7	4	0.879	5 of 10 (50.0%)	146	0.00000
D4_TURNO	9	0.874	12 of 20 (60.0%)	150	0.03775
D4_LOCAT	15	0.433	23 of 32 (71.9%)	149	0.06013

Table 8.5 – Chi-square Results Summary for Listed Variables by 'C5_LOG_R' (significant variables only)

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
A21	2	0.800	2 of 6 (33.3%)	143	0.02499

A25	2	1.239	2 of 6 (33.3%)	144	0.01474
A35	2	4.400	1 of 6 (16.7%)	148	0.04861
B5A	4	0.442	6 of 10 (60.0%)	149	0.04317
B5B	4	0.446	6 of 10 (60.0%)	152	0.08112
B5C	2	0.918	2 of 6 (33.3%)	155	0.00077
B7	4	0.333	8 of 10 (80.0%)	229	0.03719
D1	4	0.426	2 of 10 (20.0%)	145	0.00841
D3_Y_PT	2	0.125	6 of 6 (100%)	245	0.01832
D5	10	0.430	20 of 22 (90.9%)	146	0.00717
D7_LOCAT	29	0.398	54 of 60 (90.0%)	145	0.03583

Table 8.6 Chi-square results summary for listed variables by "B7_NEW" (Recoded B7 variable: 1-2=1, 3=2 and 4-5=3) (Significant variables only).

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
NETWORK	6	1.458	4 of 12 (33.3%)	146	0.01488
A7	4	2.355	2 of 9 (22.2%)	146	0.00793
A10	4	2.691	3 of 9 (33.3%)	159	0.08372
A13	4	2.353	2 of 9 (22.2%)	151	0.02191
A14	4	0.649	5 of 9 (55.6%)	179	0.01864
A15	4	1.579	3 of 9 (33.3%)	177	0.00317
A16	4	0.443	5 of 9 (55.6%)	174	0.00419
A18	4	0.414	4 of 9 (44.4%)	166	0.01922
A21	4	0.214	6 of 9 (66.7%)	150	0.03397
A24	4	0.238	4 of 9 (44.4%)	152	0.09461
A25	2	1.257	3 of 6 (50.0%)	148	0.00513
A26	4	1.069	4 of 9 (44.4%)	152	0.05363
A28	4	0.652	5 of 9 (55.6%)	161	0.01269
A30	4	2.625	2 of 9 (22.2%)	157	0.09220
A32	4	0.632	4 of 9 (44.4%)	158	0.07642
A34	4	0.200	4 of 9 (44.4%)	163	0.07651
B1_NEW	6	1.698	4 of 12 (33.3%)	147	0.00756
B3A	4	0.114	4 of 9 (44.4%)	148	0.04478
B5A_NEW	6	0.121	7 of 12 (58.3%)	154	0.00000
B5B_NEW	6	0.119	7 of 12 (58.3%)	152	0.00062
B5C_NEW	4	0.247	5 of 9 (55.6%)	156	0.03872
D5_NEW	6	0.360	5 of 12 (41.7%)	153	0.07666
D7_LOCAT	30	0.115	42 of 48 (87.5%)	149	0.02132

As indicated above, respondents' individual perceptions of the success of their network based on co-operative activities and the network to which they were affiliated were found to be related (p. <0.05). Whilst some networks enjoyed higher than expected levels of success (e.g. Alliance of Business Consultants), others suffered from higher than expected levels of failure (e.g. Business Breakfast Club). This would appear to suggest, along with

the other significant relationships discussed above, that it is foolhardy to consider networks as a single homogeneous group for which a single approach or process model could be readily applied. Rather, it would appear to indicate that networks are themselves heterogeneous, both in terms of the individuals they attract and the characteristics they display. Network brokers, facilitators and leaders should therefore be mindful of this fact when establishing and managing these groups. The differences identified in this study are likely to be an understatement, rather than an overstatement of the response that might be found in a broader study of business co-operative activities. The research programme and findings reported here have focused on Informal-Low intensity relationships as defined in the Formality-Intensity matrix outlined in Chapter Two. Given that the groups studied here were clustered together on the basis of similarity with one another, albeit perceived similarity, it would seem reasonable to expect that differences between networks examined here, and those that are classified elsewhere in the matrix will be even more pronounced.

Networks in which members communicated with one another on a regular basis were found to be more successful than those in which members did not communicate so frequently (A7 by B7_NEW) (p. <0.01). This would appear to suggest that good network communications are a prerequisite to group success. However, regular communication between members does not in itself guarantee success, as is highlighted by the fact that although some respondents indicated communications were good, the network had still failed to achieve all of the objectives set for it. From the results summarised here it seems plausible to assume that regular contact between members goes some way towards helping a network to achieve the objectives set for it, or that successful networks are characterised by more regular communication between their members.

Despite the fact that statement A10 is correlated with network success (p. <0.1) it is

difficult to identify any clear pattern within the data. Although a higher number of respondents than expected argued that benefits were evenly distributed, and that their network could be viewed as successful, results do not indicate that a higher number of individuals felt that benefits were not evenly divided, and that the network should therefore be viewed as unsuccessful. In fact the opposite is true, results presented suggest that a higher number of respondents than expected believe that benefits are divided unjustly, but despite this, felt that the network had succeeded in achieving the objectives set for it. Clearly given the small number of responses involved it is difficult, if not dangerous, to make any firm conclusions based on the data presented here. One possible explanation for the unexpected nature of this relationship (i.e. a higher than expected observed value for the strongly disagree / disagree – highly successful / successful position), rests in the probable existence of individuals who recognise that they are themselves receiving a larger share of the benefits than they perhaps deserve. So despite acknowledging the fact that some members are not receiving a fair share of the network dividend, they are themselves able to conclude that the network has succeeded in achieving the objectives set for it. This case is more probable where the responding individual is a leader of the network to which he / she is affiliated, as the objectives of the network are more likely to be congruent with the objectives of the leader's own firm.

A significant relationship was identified for statement A13 (I trust network members far more than other business people I deal with) and B7_NEW ($p. < 0.05$). Respondents who indicated agreement with this statement were far more likely to perceive the network's objectives as having been successfully achieved than those who did not believe that their fellow members were trustworthy. At the other end of the scale, where a respondent indicates that other members of the network are not more trustworthy than other business people they deal with, they are more likely to indicate that the network has not been a

success. Such deviations from expected values would not be evident if the null hypotheses of no relationship between the two variables could be sustained. It would therefore seem reasonable to conclude that when trust exists within a network the likelihood of that same network achieving the objectives set for it is increased. What is not clear however, is whether the existence of trust within a network increases the networks chances of succeeding, or whether inter-network trust simply grows in successful networks.

As with the contingency table outlined above for statement A10 by B7_NEW, evidence of a statistically significant relationship is also provided for statement A14 (Large firm members contribute proportionately more money and resources than their smaller counterparts) by B7_NEW (p. <0.05). The exact nature of this relationship is not immediately clear. Variations from the expected values for the "strongly agree / agree" positions on the statement A14 axis are small enough to be considered negligible. Although some movement away from expected values for the "neither agree / disagree" positions on the statement A14 axis are noted, the most interesting variations are to be found for the "strongly disagree / disagree" positions. A higher than expected number of respondents indicated that they did not believe that larger firm members contributed proportionately more money or resources to the network, whilst at the same time they indicated that the networks in which they operated could be considered to be successful. There is therefore *prima facie* evidence to suggest that where larger firm members do not contribute proportionately more money or resources, the likelihood of success within those networks is higher than might otherwise be expected. This may be attributable to the fact that where larger firms contribute proportionately more financial capital or resources to the network they benefit from a concomitant increase in the power they are able to exercise within their group. If this argument is valid, it seems reasonable to expect to view fair allocation of the group's costs as a precursor to an increase in power amongst larger

members. As with the other relationships discussed above, conclusions drawn here should be viewed as largely conjecture, given the high number of cells with a frequency of less than five which undermines the significance of the relationship. Conclusions drawn are therefore limited in terms of their usefulness, and should be limited to formulating hypotheses or research problems for others to test or solve in the future.

Initial analysis of the contingency table relating to variables A15 (All networks were in agreement at the outset, as to what the objectives of the network should be) and B7_NEW, would appear to suggest that a network is more likely to be successful when its members are in agreement at the outset as to the objectives of that network (p. <0.01). More detailed investigation reveals that to make such a conclusion is to oversimplify the relationship that may exist between the two variables. Although it is true to say that such a pattern of variation exists for "Highly successful / Successful" networks (as respondents who indicated a position of agreement with the statement were more likely to be affiliated with successful networks than expected, and the "Neither Agree / Disagree" and "Disagree / Strongly Disagree" positions were more likely to have observed values that were lower than expected) the opposite situation (lower than expected number of respondents indicating "Strongly Agree / Agree" – "Unsuccessful / Highly Unsuccessful", and a higher than expected number of individuals indicating "Disagree / Strongly Disagree" - "Unsuccessful / Highly Unsuccessful") proves to be the case. In fact it appears that the "Strongly Agree / Agree" position on the A15 scale identifies a polarisation in terms of individuals response. Higher than expected numbers of respondents indicate that they are members of either "Highly Successful / Successful" or "Unsuccessful / Highly Unsuccessful" networks, with the number belonging to networks which could be described as neither successful or unsuccessful being lower than expected. At the other end of the A15 scale, differences between observed and expected values are minor. Once again the

data prevents any firm conclusions from being drawn. If however, the same caveats that have been extended in the discussion of other findings are applied here, it is possible to draw the following tentative conclusion. It would appear that network success was related to early agreement between its members as to the strategic direction and objectives of the group. This relationship was however not a straightforward linear association, but rather a more complex correlation, in which respondents who indicated that their network's members were in agreement at the outset as to the objectives of the group, were for the most part likely to dichotomise in terms of their perceptions of the network into one of two groups, perceiving themselves as being members of either successful or unsuccessful networks. This conclusion seems logical. A network in which all or most of its members were in agreement on its objectives was more likely to achieve those objectives, as is shown by the fact that higher than expected numbers of respondents fell into the "Strongly Agree / Agree" – "Highly Successful / Successful" group. On the other hand because the group's aims and goals were known to all, and all were in agreement on them, it is possible that these objectives and the strategy set out to achieve them, will not be revised. As all members shared some degree of responsibility for the creation of the group's objectives there may have been a reluctance to speak out even if those objectives were not achieved. It is therefore possible that a self-perpetuating conspiracy of silence and sub-optimal network performance may persist then in some groups in which all members agreed on the objectives for the group at the outset.

A similar non-linear association is noted for the contingency table for the A16 and B7_NEW variables (p. <0.01). Once again it was found that where respondents indicated strong agreement with the statement, conflict between members was rare. Opinion as to the success of the network therefore polarised towards the scales extremities. Higher than expected numbers of respondents who indicated strong agreement or agreement with the

statement also indicated that their networks were "Highly successful / Successful" or "Unsuccessful / Highly Unsuccessful". Whilst at the same time a lower than expected number of individuals indicated that their group could be described as "Neither Successful / Unsuccessful". The findings reported for this correlation would appear to support the conclusions drawn from the preceding discussion concerning network members' agreement on the network's objectives (A14) and the success of their network's activities (B7_NEW). Thus it would appear that in some instances a harmonious relationship between group members leads to successful networks, but for others, simply sub-optimal network performance. It would therefore seem reasonable to contest that sub-optimal performance is more likely to occur where the network is comprised of actors with homogeneous personalities, backgrounds and experiences. The art of managing a group therefore seems to rest in maintaining a network which allows open debate and the expression of a diverse range of ideas, whilst at the same time minimising the level of conflict that is otherwise likely to occur within it.

Where the costs associated with running a network are split fairly between members, (A18) the chances of that network achieving success are increased ($p. < 0.05$). A higher than expected number of respondents who indicated agreement or strong agreement with the statement that costs were divided fairly between members were found to be members of successful or highly successful networks. Conversely fewer respondents than expected who agreed with the statement, indicated that they were affiliated to networks which could best be described as highly unsuccessful, unsuccessful or neither successful nor unsuccessful. Where respondents were not able to agree that network costs were evenly split they were more likely to indicate that their network based activities were unsuccessful, or neither successful or unsuccessful. The research therefore suggests that networks in which costs are divided fairly between all members stand a better chance of being

successful, or at least perceived as being so by their members, than those in which group associated expenditure is not seen to be so equitably split.

For networks where individual respondents were unable to agree with the statement "I believe that network members as a whole are sincere and honest" (A21) the chances of those groups being perceived as successful was much lower (p. <0.05). Higher than expected numbers of successful networks were recorded for respondents who registered agreement or strong agreement with the statement that members were on the whole honest and sincere. On the other hand, individuals who indicated that they were unable to agree or disagree, or actively disagreed with the statement were more likely to be members of a successful network than would otherwise be expected. It would therefore seem reasonable to conclude that a network is more likely to enjoy success where its members consider one another to be both honest and sincere. Conversely where they distrust other members the likelihood of them expressing a belief that the network is successful is likely to be reduced.

Despite the fact that a statistical relationship seemed to exist between statement A24 ("I would be more inclined to co-operate if competition were more intense") and variable B7_NEW (p. <0.1), it is not possible to identify any coherent pattern within the data, and as a result it is not possible to draw any conclusions relating to this relationship. Once again however, the existence of such an association merits further investigation and the result presented here represent a possible hypothesis which could be tested as part of such an investigation.

The existence of a correlation between statement A25 ("Network members are friendly and approachable") and networks success (B7_NEW) would appear to suggest that a congenial atmosphere within a network has a positive effect on the network's likelihood of

succeeding. Similarly, where a network succeeds the probability of good relations within it is increased (p. <0.01). This contention is supported by the contingency table for these two variables. Where respondents indicated agreement with the statement that network members were friendly and approachable higher than expected levels of successful networks, and lower than expected levels of neither successful or unsuccessful, or unsuccessful networks were noted. Conversely where respondents did not agree with this statement, that is to say they selected the "Neither Agree / Disagree" position, lower than expected levels of successful and higher than expected levels of non-successful networks were noted.

A correlation was identified between statement A26 ("I place greatest trust in those members of the network with whom I have had the greatest contact in the past") and B7_NEW (p. <0.1). Respondents who indicated agreement with the statement did not have higher observed values than would have been expected if the null hypothesis of no relationship were sustained. Elsewhere in the table however, variation away from expected values were identified. Where respondents were unable to decide whether they placed greater trust in members they had known for longer, they were more likely than expected to indicate that the network was "Neither Successful / Unsuccessful". Most importantly, where members indicated disagreement with the statement, thereby suggesting that the amount of time for which an individual had been known was not a key determinant of trust for them, the likelihood of their being a member of a successful network was notably higher than expected. If statement A26 is turned on its head, it is possible to suggest that it is inferring that relations between respondents and other members of the network which they have not known for so long might be considered as poor. As a result of this, these individuals, because of the amount of time they have been known to the respondent cannot be considered as trustworthy. If this supposition is accepted, it seems reasonable to expect

that networks in which significant trust differentials do not exist will enjoy greater co-operative success than those in which such differentials are evident.

Where a respondent indicated that the group rarely made decisions that went against their wishes, they were found to be more likely to indicate that the network had been a success. Conversely, where respondents indicated disagreement with statement A28 thereby suggesting that the group had gone against their wishes, they were more likely to conclude that the network had been neither successful or unsuccessful, or unsuccessful (p. <0.05). Once again then it is possible to conclude that harmonious relations within the network increase the chances of that network being perceived as successful by its members. Where an individual believes that decisions are being made which regularly go against their wishes, they are more likely to indicate that the network is not successful (i.e. network success is viewed at the individual, not the collective level). Network facilitators, leaders and brokers could on the basis of these results aim to maintain a good atmosphere within the network and good relations between its members. Although such an approach does not guarantee success in the objective sense (i.e. quantifiable increases in members sales, profits, etc.), the likelihood of the network being perceived as being successful is likely to be higher.

Where all members of the network were perceived as being committed to the success of the group (A30), the perceived success of the network was higher than expected (p. <0.1). In contrast, where members were not viewed as being committed a higher than expected number of unsuccessful or neither successful or unsuccessful networks were identified. It would therefore appear, as one might expect, that the success of a network will be related to members' commitment to it. Individuals wishing to maximise the success of their networks should therefore strive to achieve high levels of commitment amongst all of its

members.

Although a correlation is identified for statement A32 ("Network meetings are rarely arranged, and when they are, are poorly attended") and network success (p. <0.1) the nature of this relationship is too difficult to determine from the data summarised here. The lack of any coherent pattern is perhaps precipitated by the fact that this statement is in fact composed of two separate items. It is therefore possible for respondents to agree that network meetings are rarely arranged, but disagree with the statement that they are poorly attended when they are arranged, and vice versa. The poor construction of this question alone therefore prohibits meaningful interpretation of results relating to it.

Where respondents indicated agreement with the statement that "No single individual uses their firm's power in terms of market share, turnover, etc to dominate the group" (A34) the chances of their network being a successful one were significantly higher (p. <0.1). At the other end of the scale ("Disagree / Strongly Disagree") there were negligible differences between observed and expected values. Where respondents indicated that they were not able to agree or disagree as to whether the group to which they were affiliated was dominated by a single firm, they were more likely to be members of non-successful networks than might otherwise be expected. From this result it seems reasonable to conclude that actors responsible for the day to day management and long run success of a network should try to ensure that no single firm or firms dominate the group. Power differentials or a perception of non-equal membership is likely to lead to sub-optimal network performance, with networks failing (at least in the eyes of their members) to achieve the objectives set for them.

A relationship would also appear to exist between the length of time for which an

individual has been a member of their network (B1), and the level of success they associate with it (p. <0.01). Higher than expected numbers of respondents who had been members of their group for less than a year, or from thirteen months to two years, indicated that their networks could be considered as being neither successful or unsuccessful. The benefits of network membership appeared to filter through to respondents after between twenty-five and thirty six months after joining the group (a higher than expected level of successful networks was recorded for this group). Alternatively, those individuals who perceived the network as unsuccessful left within two years of joining the group. Where respondents had been members of their group for three years or more, a higher than expected number indicated that their networks could not be considered as successful. Although the following statement is mainly conjecture, from the results relating to B1_NEW and B7_NEW summarised here, it would appear that network benefits accrue to network members over time. This would seem to be a reasonable assumption, as it will take a while for a member to get to know others within the group, and to begin to be able to exploit the co-operative opportunities that present themselves. The decrease in perceptions of success over the three year threshold may well be attributable to complacency on the part of responding members. Members may no longer be pursuing co-operative opportunities and maximising the benefits of membership with the same enthusiasm as they have in the past. It may therefore be concluded that after three years network membership and participation is largely habitual. Given the small financial and time costs associated with membership of many of the networks researched here, this supposition seems reasonable. It is easier to be a member than it is to make a conscious decision to upset people by quitting. This relationship, or at least this explanation, is therefore not likely to be valid where network commitment is higher, whether this commitment is measured in terms of time, capital or resources employed.

In line with expectations, co-operative activity (in this case membership of a network) is more likely to be perceived as successful when it has led to a noticeable increase in the respondent's firm's profitability (B5A_NEW by B7_NEW) (p. <0.01). Where membership of the group has not led to an increase, that is to say profits have fallen or remained unchanged, the likelihood of a respondent indicating that the network was unsuccessful or neither successful or unsuccessful was increased. An identical pattern is evident for network success and change in sales as a result of co-operation (B5B_NEW) (p. <0.01) and network success and the change in market share experienced as a result of membership. One caveat needs to be extended before any conclusions can be made in relation to this result, however it should be noted that question B5 is broken into three component parts: profits, sales volume and market share, referred to here as B5A, B5B and B5C respectively, and is worded: "What effect in percentage terms has co-operation had on your firm in the following areas". Emphasis in interpreting this result should be placed on the word co-operation. Because of the way that the question is phrased, responses given here cannot be considered as referring exclusively to network based activity. Having said this however, the existence of the relationship detailed above seems reasonable, and although network activity and general co-operative activity are clearly not mutually exclusive, the results reported should not be dismissed, merely used with caution. It is therefore possible to cautiously conclude that respondents are more likely to view their networks as being successful if they impact positively on the firms' profit margins, sales volume or market share. Where membership of these groups has no effect, or has a negative effect on these factors, participation in the network is likely to be viewed as less successful. Network brokers, leaders, managers, facilitators and advisors should be mindful of this possibility when assessing network success, and the scope for changes in the group's strategy. At the end of the day, network members will probably assess the success of their co-operative activities in quantitative terms. Whether this assessment is conscious or sub-conscious, is

not relevant. Such an observation does however demonstrate that there is a need for actors associated with these networks to justify their actions quantitatively, and be accountable for them to the network's members.

Broadly speaking, the more of a respondent's firm's annual turnover which can be attributed to membership of the network (D5), the more likely they are to indicate that the network has been successful (p. <0.1). Respondents who indicated that ten percent or less of their income could be traced back to membership of their network were conversely more likely to indicate that group based co-operation had been "neither successful or unsuccessful". The following observation is presented as a possible explanation for this relationship. Individuals who can attribute less than ten percent of their turnover to network based co-operation may well be disillusioned, as they may well have expected their participation, given the amount of time, effort and resources that they have invested, to exceed this level. In contrast respondents who derive twenty percent or more of their annual income from group based co-operation are probably satisfied with this investment.

Although a significant relationship is identified between a business' location and the level of co-operative success it enjoys (p. <0.05), given the number of counties from which respondents are drawn and the number of networks involved little can be concluded from this result. However an investigation of the relationship between these two variables could be conducted as part of a later empirical investigation. If such a study were restricted to a single network (it would need to be a large one) it would be possible to investigate the significance of location and proximity to other network members in more detail. Hypothetically, it would seem reasonable to assume that members of a group who are located further away from the network's office or meeting place may not be able to attend so frequently, and may therefore have a reduced impact on the network's strategy. As a

result of this they are likely to accrue fewer benefits, and are therefore more likely to perceive the network as being less than successful. Clearly this supposition will need to be tested empirically before any such statement can be realistically supported.

Table 8.7 Chi-square results summary for listed variables by "C5_NEW" (Recoded C5 variable: 1-2=1, 3=2 and 4-5=3) (Significant variables only).

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
NETWORK	16	0.300	17 of 27 (63.0%)	53	0.01267
Q18	4	0.842	2 of 9 (22.2%)	82	0.09238
Q25	4	0.203	4 of 9 (44.4%)	56	0.00026
B1_NEW	8	1.523	5 of 15 (33.3%)	56	0.08105
B3A	4	0.051	4 of 9 (44.4%)	58	0.00019
B5B_NEW	6	0.112	5 of 12 (41.7%)	74	0.05726
B5C_NEW	4	0.234	4 of 9 (44.4%)	82	0.07639
C2_NEW	8	0.769	5 of 15 (33.3%)	71	0.07027
C7	4	0.321	6 of 9 (66.7%)	141	0.01745
D1_NEW	6	1.959	4 of 12 (33.3%)	59	0.01856
D5_NEW	6	0.521	4 of 12 (33.3%)	61	0.00000
D7_POSIT	2	0.479	2 of 6 (33.3%)	65	0.01838

As indicated above in table 8.8, a respondent's individual perception of the success of their co-operative activities and the network to which they were affiliated were found to be related (p. <0.05). Some networks enjoyed higher than expected levels of success (e.g. Mayflower Produce), whilst others suffered from higher than expected levels of failure (e.g. Business Breakfast Club).

Co-operative success also appeared to be affected by the extent to which network costs were perceived as being split fairly between members (p. <0.1). An examination of the contingency table for these two variables (A18 and C5_NEW) would appear to indicate that an individual is more likely to perceive their co-operative activities as a whole as being successful when the costs associated with network membership are shared evenly between all members of the group, and less so when they are not. Evidence for this contention is provided by the fact that higher than expected values were recorded for the tables key cells: "Highly successful / Successful – Strongly Agree"; "Neither Successful or Unsuccessful –

Neither Agree / Disagree" and "Unsuccessful / Highly Unsuccessful – Disagree / Strongly Disagree".

The level of success that a respondent enjoyed in terms of their general co-operative activities would also appear to be related to the degree to which network members could be said to be friendly and approachable (A25) (p. <0.01). Where respondents indicated that members were friendly and approachable a higher than expected number of respondents stated that their co-operative activities as a whole could be said to be successful. Conversely where respondents indicated that network members were not friendly they were more likely to indicate that their co-operative activities had failed to achieve the objectives set.

Although statistically there would appear to be a relationship between the length of time for which a respondent has been a member of their network (B1_NEW) and the success of their co-operative activities as a whole (C5_NEW) (p. <0.1), interpretation of this relationship is difficult. Despite the fact that there are significant variations away from expected values for all of the cells in the contingency table it is not possible to identify any clear pattern that might be used to explain these variations. Firm conclusions about this relationship cannot therefore be made. However the existence of such a relationship constitutes a justifiable starting point for researchers who wish to conduct further empirical investigation into these variables at a later date.

Although no relationship was identified between respondents' assessment of the effect co-operation had had in profit terms (B5A_NEW) on their business and co-operative success, a correlation did exist for two other quantitative measures, the effect on sales volume (B5B) and market share (B5C). Perhaps unsurprisingly, respondents were more likely to

indicate that their co-operative activities had been successful when they led to an increase in sales. Where no change in sales volume was recorded respondents were more likely to state that co-operation was "neither successful or unsuccessful" or that it was unsuccessful (p. <0.1). A similar pattern existed between the change in market share that a respondent identified, and the success of their co-operative activities. Where co-operation led to an increase in market share, the respondent was more likely to indicate that their activities had been successful. Where co-operation had led to no change in the market share of the respondent's firm, they were more likely to indicate that co-operation had been less than successful.

No significant relationship could be found between the amount of time that a respondent spent developing contacts for the future (C1_NEW) and the success of the co-operative activities in which they were already involved. However, a relationship did however exist between the co-operative success that a respondent perceived themselves as enjoying, and the number of hours a week that they spent maintaining existing co-operative relationships (C2_NEW) (p. <0.1). Respondents who indicated that they spent less than an hour maintaining these relationships were more likely to conclude that their co-operative activities were less than successful. Individuals who spent over an hour a week nurturing their relationships were more likely to indicate that their relationships were successful. It is not clear however, whether successful co-operative activities require high time maintenance, or whether time investment in this way results in co-operative success.

There would also appear to be a relationship between the C7 variable (If presented with a choice, which sex would you prefer to co-operate with?) and the success of respondents' co-operative activities as a whole (p. <0.05). It should however be noted that differences between expected and observed values for respondents who indicated they had no

preference are negligible, and the number of respondents who indicated a preference for one gender or another was quite small (N=24). This caveat aside, one finds that respondents who would prefer to co-operate with males enjoyed less co-operative success than those who expressed a preference for female co-operative relations. This finding may however just be a function of the sample of networks chosen. The Women in Business network to which a substantial number of the female respondents included in this research were affiliated seemed to operate more in the capacity of a support network than a profit or growth orientated group as the other networks could be more accurately defined. The C5_NEW variable (Looking at your co-operative activities as a whole, please indicate the level to which they have been successful in achieving the objectives which were set for them) is therefore likely to be collecting information that does not realistically compare like with like. The correlation between C7 and C5_NEW related above should therefore be treated with caution, although once again it represents a justifiable starting point for researchers who wish to conduct further empirical investigation into these variables at a later date.

One of the other measures which was used to assess network success, was the percentage of annual turnover which could be attributed to network membership (D5_NEW). A correlation was identified between D5_NEW variable and the respondents' perception of success of their co-operative activities as a whole (p. <0.01). Respondents were less likely to indicate that their co-operative relationships were successful when ten percent or less of their income could be attributed to membership. Conversely, respondents' co-operative relationships were successful when turnover derived from them exceeded the same threshold.

Firm conclusions based upon the findings of the contingency table for the respondent's

position in the firm (D7_NEW) and their perception of the success of their firm's co-operative relationships are not possible. The small number of respondents who indicated they were managers as opposed to owners of the firm (managers represented less than six percent of all respondents included in the analysis) prohibits sweeping statements about the results derived. From the results presented however, it would appear that owners of the firm are more likely to indicate that their co-operative activities are "neither successful or unsuccessful", whereas managers responses were more likely to fall into other two groups. Managers of the firm are therefore more likely to perceive their firm's co-operative relationships as being either successful or unsuccessful. This result perhaps reflects the fact that managers feel more able to distance themselves from the firm and the success of its co-operative relations, and as a result are able to be objective about the success achieved. Owners on the other hand, are not able to distance themselves in this way, and are therefore more likely to categorise the network as neither successful or unsuccessful, as by categorising it in any other way they are effectively criticising their own performance.

8.3 Phase Two Hypotheses and Discussion

Phase Two of the research programme reported here has sought to investigate the following hypotheses, each of which will be discussed in turn.

H6: The attitudes and behaviour indicated by respondents will be related to the network to which they are affiliated.

H7: The performance of an owner-manager's business will influence their perception of

network success.

H8: The level of trust which exists between participants will influence owner-manager's perception of network success.

H9: The level of commitment which exists within the network will influence owner-manager's perception of its success.

H10: Interpersonal relationship factors which exist between participants will influence owner-manager's perception of network success.

H6: The attitudes and behaviour indicated by respondents will be related to the network to which they are affiliated.

Results reported earlier in this chapter would appear to support the contention that respondent's attitudes and behaviour is related to the network to which they belong. Significant results were reported to exist between the network to which a respondent was affiliated and a number of other variables which included the location of co-operative partners, the degree to which respondents believed they had things in common with other; members, the extent to which a respondents market sector could be said to be competitive; the level to which network benefits were shared evenly between the group; respondent and firm demographics and the level of co-operative success a respondent enjoyed, either within the network, or for their co-operative activities as a whole.

As has been discussed at length throughout this chapter, although the statistical

significance of single relationships between variables is open to criticism, as the number of cells with a frequency of less than five exceeds the conventional threshold of twenty percent, given the number of such relationships which exist between the "network" variable and others included in the second standardised postal questionnaire which was administered as part of phase two of this research, it seems reasonable to conclude that the null hypothesis of no relationship between the "network" variable and other variables related herein should be rejected. Tentative acceptance of the alternative hypothesis (H6) is therefore made. It is important to stress that this acceptance is a tentative one which will require further study and empirical investigation.

The existence of a relationship between the network to which a respondent is affiliated is however, not without intuitive appeal. In fact the existence of such correlations would appear to follow common sense. This research has shown that relationships exist not only between respondent and firm demographics and the network to which the respondent belongs, as could easily have been predicted, even given the comparison of groups with similar characteristics as expressed in terms of their relative intensity and formality, but also between the network variable and attitudes towards and behaviour within the group.

This finding throws into question a lot of the research which has been conducted in the networking / business co-operation field, much of which is guilty not only of generalising its conclusions outside of the national culture in which it was conducted, but which is also guilty of making sweeping statements about business co-operation *per se* on the basis of a small, network specific sample. The results of this research programme would appear to suggest that such approaches are fundamentally flawed. Attitudes, behaviour and demographics appear to differ dramatically between groups. Researchers should therefore be wary of drawing conclusions based on a single network, and offering their results as a

panacea to cure the co-operative ills of networking practitioners and theoreticians. Such individuals should instead seek to study networks / network respondents in pairs or clusters in which as many variables as possible are controlled for as possible, by controlling for demographic and non-attitudinal / behavioural characteristics in this way it may be possible to gain greater insight into the factors which affect co-operative attitudes and behaviour.

In the meantime theoreticians and practitioners alike should follow an atomistic research route in which networks or groups are considered in terms of their own demographics, histories and idiosyncrasies. Although the research programme reported herein is able to proffer some guidelines for individuals looking to facilitate co-operative development or growth, it falls a long way short of providing answers to all of the conundrums that business co-operative propensity and success provide. Results derived from it provide strong evidence to suggest that there is a need to reorientate network research so that it considers results and conclusions derived less as global solutions, and more as atomistic and largely network specific guidelines. Only as the body of available empirical research in this area grows, and most especially longitudinal studies, will it be possible to offer guidelines which are more capable of being generalised at the global level. Until then, researchers should recognise the fact that networks vary greatly between one another, and should act and analyse them accordingly.

H7: The performance of an owner-manager's business will influence their perception of network success.

Five demographic variables, which could be taken as crude measures of firm performance, were included in the second standardised postal questionnaire. Respondents were asked to

indicate which markets their firm was currently competing in, local through to international (D1); the number of full time and part time employees the firm retained (D2_FT and D2_PT); the number of years for which the firm had been established (D4_YEAR); firms turnover for the previous year (D4_TURNO), and the average profit margin the firm achieved in the previous three years.

In the interest of maximising result validity recoded versions of the firm's demographic variables were cross-tabulated against the aggregated network success variable – B7_NEW. Table 8.9 below summarises chi-square results derived in this way.

The employment variables (D2_FT and D2_PT) were recoded and aggregated into the following groups. D2_FT was recoded into D2_FT_NE (1 = 0 employees = 18.5% of original variable; 2 = 1 employee = 25.5%; 3 = 2 to 5 employees = 17.6%; 4 = 6 to 10 employees = 10.0%; 5 = 11 to 20 employees = 11.2% and 21 or more employees = 17.2%), whilst D2_PT was recoded into D2_PT_NE (1 = 0 employees = 35.6% of original variable; 2 = 1 employee = 20.1%; 3 = 2 employees = 16.0%; 4 = 3 to 5 employees = 17.8%; 5 = 6 or more employees = 10.5%).

Table 8.8 – Chi-square results for Network Success (B7_NEW) by Firm Demographic Variables

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
D1_NEW	6	1.731	4 of 12 (33.8%)	149	0.53012
D2_FT_NE	10	0.577	12 of 18 (66.7%)	149	0.05812
D2_PT_NE	8	1.069	8 of 15 (53.3%)	152	0.09259
D4_YEAR_N	6	1.053	6 of 12 (50.0%)	158	0.62862
D4TURN_N	12	0.466	15 of 21 (71.4%)	150	0.16379
D6_NEW	8	1.000	7 of 15 (46.7%)	157	0.13228

Given the high number of cells with a frequency of less than five, and the high number of missing observations, results derived from cross-tabulating firm demographic variables

against network success should be interpreted with caution. Only two variables however can be considered as being significant at the ten percent level, the number of full time (p. = 0.05812) and part time staff (p. = 0.09259) a firm employs. Two further variables, firm turnover and average profit margins realised are 'bubbling under', that is to say they are approaching acceptable significance levels, in this case p. = 0.16379 and 0.13228 respectively.

Examination of the contingency tables relating to these variables (D2_FT_NE by B7_NEW and D2_PT_NE by B7_NEW) reveals no clear pattern in the data. Although the observed values deviate away from expected values in nearly all cases, variations are in many cases not high. It is therefore possible that cross-tabulation of the same variables using a larger sample would not identify a significant relationship.

Either way there is insufficient evidence presented here with which to support hypothesis seven, which states that the performance of an owner-manager's business will influence their perception of network success.

On the basis of this research then, it is reasonable to conclude that there is no need, or advantage to be gained for network brokers or managers in targeting firms, and the attention they give them on demographic bases. The existence of a 'seemingly significant' relationship between the employment variables measured here, and the presence of two other variables in which the cross-tabulations were approaching significance do however represent an interesting starting point for future theoretical investigation and empirical research.

H8: The level of trust which exists between participants will influence owner-manager's perception of network success.

Eight items on the second standardised questionnaire which was administered as part of phase two of this research were designed to measure respondents general trust propensity, the extent to which they could be said to trust other members of the network, and the degree to which they were prepared to operationalise their trust in others. The items in question were all contained in section A of the survey and were comprised of statements three, eight, thirteen, seventeen, twenty one, twenty six, twenty nine and thirty three. Table 8.9 outlined below is a summary of results relating to these items and the significance of cross-tabulations between them and the B7_NEW variable, which was used to measure respondents' perceptions of the network's success.

Table 8.9 – Chi-square results for Network Success (B7_NEW) by Trust Variables

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
A3	4	1.009	4 of 9 (44.4%)	146	0.64766
A8	4	1.458	2 of 9 (22.2%)	146	0.53864
A13	4	2.353	2 of 9 (22.2%)	151	0.02191
A17	4	0.800	4 of 9 (44.4%)	148	0.61997
A21	4	0.214	6 of 9 (66.7%)	150	0.03397
A26	4	1.069	4 of 9 (44.4%)	152	0.05363
A29	4	1.735	3 of 9 (33.3%)	155	0.51391
A33	4	1.132	4 of 9 (44.4%)	147	0.91779

Investigation of Table 8.9 and the contingency tables from which it is derived indicate that there are only three variables which are identified as being statistically significant; A13, A21 and A26.

Item A13 asked respondents to indicate the extent to which they agreed with the statement that they trusted network members far more than other business people they dealt with.

The observed number of individuals who agreed that they did was significantly higher than the expected value. Conversely, respondents who indicated disagreement with the statement or were unable to decide one way or the other were more likely to be members of networks which had not achieved the objectives set for them (i.e. defined as "Unsuccessful / Highly Unsuccessful or "Neither Successful or Unsuccessful").

Statement A21 asked respondents to indicate the level to which they felt able to agree that network members as a whole were honest and sincere. Respondents who indicated agreement with the statement were more likely to be members of successful networks and less likely to be associated with networks which could be described as unsuccessful or neither successful or unsuccessful. Respondents who felt that fellow network members were not honest and sincere, or were unable to decide one way or the other, were less likely (than expected) to indicate that they were members of successful networks, and more likely than expected to indicate that they were associated with groups which could be most accurately described as "Unsuccessful / Highly Unsuccessful or "Neither Successful or Unsuccessful".

A statistically significant relationship is also identified between respondents' perceptions of network success and statement A26 ("I place greatest trust in those members of the network with whom I have had the most contact in the past"). Broadly speaking there were no significant differences between observed and expected values for variable B7_NEW, for respondents who indicated agreement with this statement. However, differences between expected and observed values were evident for the "Neither agree / Disagree" and "Strongly disagree / Disagree" positions. Individuals who were unable to decide one way or the other with regard to statement A26 were more likely to indicate they were members of networks which could be described as "Neither successful or unsuccessful" or

"Unsuccessful / Highly Unsuccessful", and less likely to indicate that they were affiliated to a network which could be characterised as successful. The most interesting variations away from expected values though, are to be found in relation to respondents who indicated disagreement with the statement. Nearly twice as many of these individuals than would have been expected if no relationship existed between the two variables, indicated that their networks could be characterised as being "Highly successful / successful". Observed values for the other two positions ("Strongly disagree / disagree" – "Neither successful / unsuccessful" and "Strongly disagree / disagree" – "Unsuccessful / highly unsuccessful") were lower than would have been expected if a significant relationship could not be proven.

None of the other items included as measures of trust were related to the respondents' perception of network success. This is not as surprising as it first seems, no relationship could be shown to exist between respondents' general trust propensity (A3), their trust propensity when dealing with people in a business context (A8), the extent to which their trust in members could be said to have increased over time (A17), the degree to which respondents were prepared to consider an individual trustworthy if they were recommended by someone they trusted (A33) and the respondents' perception of network success. This is not really surprising, given that none of these variables are measures of trust within the network itself, logically then one would not expect to see a relationship between these variables and the network success measure – B7_NEW.

The absence of a relationship between statement A29 ("I trust other members of the network to make important decisions that affect my firm, even when I am unable for some reason to make them myself") and B7_NEW is intriguing. It would have seemed reasonable to hypothesise that respondents who indicated agreement with statement A29

were more likely to be members of successful networks than those who disagreed. Although this proves to be the case, there are no significant differences between observed and expected values for respondents who were unable to agree or disagree with the statement, or who actively disagreed with it. It is therefore possible to conclude that although the likelihood of a network succeeding will be greater where members are prepared to operationalise their trust in one another, the absence of such a propensity to operationalise trust does not preclude the network from being a successful one.

Sufficient evidence has been presented with which to reject the null hypothesis of no relationship between trust measures and network success in favour of alternative hypothesis eight, in which it was stated that the level of trust which exists between participants will influence owner-managers' perceptions of network success.

Rejection of the null hypothesis and acceptance of the alternative hypothesis has clear implications for all actors involved in initiating, developing or fostering successful business networks. No attempt has been made in this research to determine the direction of the causal relationship which exists between a network's success and the level of trust evident within it. Whether the existence of trust in a network increases its likelihood of success, or whether successful networks naturally increase trust between members is not important. The attempted development of inter-member trust at the network's outset is not likely to have a negative affect on its success propensity, whereas the potential gains from fostering trust would appear to be high. Network managers, leaders and brokers should therefore aim to develop intra-network trust from the outset, as networks in which inter-member trust is high have clearly been shown to display a higher propensity towards success than networks which cannot be categorised in this way.

H9: The level of commitment which exists between participants will influence owner-manager's perception of network success.

Table 8.10 shown below summarises chi-square results derived from cross-tabulating the network success variable (B7_NEW) by items A9, A14, A22, A30, A36, B1, B6A, B6B_I, B6B_II, B6B_III and B6B_IV. These were included in the questionnaire as a means of measuring respondents' commitment to the network. The extent to which an individual could be said to be committed to the network, it was hypothesised, would affect their perception of the network's success.

Table 8.10 – Chi-square results for Network Success (B7_NEW) by Commitment Variables

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
A9	4	0.125	6 of 9 (66.7%)	157	0.52584
A14	4	0.649	5 of 9 (55.6%)	179	0.01864
A22	4	0.538	4 of 9 (44.4%)	160	0.41514
A30	4	2.625	2 of 9 (22.2%)	157	0.09220
A36	4	1.376	3 of 9 (33.3%)	168	0.75578
B1_NEW	6	1.698	4 of 12 (33.3%)	147	0.00756

Of the six network commitment measures for which meaningful data was obtained (B6BI through to B6BIV had a high item omission level or misinterpretation rate) that were included in the questionnaire only three were shown to be significantly related to network success, statements A14, A30 and variable B1_NEW. Networks in which a higher than expected number of respondents indicated that large firm members contributed proportionately more money and resources than their smaller counterparts, were however, no more likely to indicate that their network was successful than those who had not.

However, respondents who indicated that larger firms did contribute proportionately more were more likely to be members of successful networks. This would appear to suggest that the relationship between network success and the respondent's firm's commitment is more complex than might initially have been anticipated. It is possible that the quantity of money and resources that a firm is prepared to commit to the network affects the power they are able to exercise within it. It is therefore not entirely surprising to find a higher than expected number of respondents indicating disagreement with statement A14, whilst at the same time highlighting the fact that they are members of successful networks. It is possible to tentatively conclude that a firm's commitment to a network will not always have a positive effect on the way in which other members perceive the network. The possible negative effects of a firm's commitment to the network is evidently an area which merits further investigation as part of future empirical research in the co-operation – business networks arena.

This contention, appears to be supported by the results for statement A30 ("All members are equally committed to the success of the network") by network success. Contingency table results indicate that a network is more likely to be characterised as success where a respondent is able to agree with statement A30, and is more likely to be described as unsuccessful when they disagree with it. This would appear to suggest that either networks in which all members are equally committed to the network are more likely to enjoy success, or that commitment to these networks increases over time as the benefits of being affiliated to them becomes apparent. Either way, actors seeking to maximise network success should make every effort to ensure that all members are equally committed to the group, as with intra-network trust, attempted development in this way is not likely to have a negative affect on the levels of success realised by the network.

A statistically significant relationship was not identified between network success (B7_NEW), and any of the other commitment measures included in the questionnaire. The absence of a correlation between network success and individual responses to statement A9 ("Commitment to the network varies widely, with some firms putting in less effort than others") is surprising, as it is effectively an inverse representation of statement A30; given that this variable indicated that successful networks were more likely to contain members who were equally committed to the group, than members who were not. It is reasonable to expect that if a relationship truly exists between network commitment and success, the opposite would be true for statement A9 by variable B7_NEW, but this does not, as has already been stated appear to be the case. This discrepancy would appear to suggest either that the results derived from cross-tabulating A30 by B7_NEW are a product of chance, and not the existence of a relationship as has been postulated, or that the design of statement A9 is somehow flawed. Further analysis of statement A9 would appear to suggest that the later option is the more likely. A9 is in fact offering two statements, presented as one. It is possible for a respondent to agree with the first statement, "Commitment to the network varies widely", whilst disagreeing with the second, "some firms put in less effort or resources". Alternatively, individuals respond to one of the statements, but not the other. It is not then surprising that a statistically significant relationship is not identified. Respondents may decide that they agree with one statement and disagree with the other, in which case they may indicate a position of "Neither agree / disagree". However, if the level to which they agree with the former statement is not counteracted exactly by the latter they may well indicate agreement or disagreement. The poor design of this statement therefore precludes any meaningful interpretation of the results derived from it.

A similar attempt at measuring network member trust to that made by statement A30, and

attempted by A9 is made in statement A22 ("Resource or time commitment from some members is negligible"). Once again however, a statistically significant relationship between this variable and the respondent's perception of the network's success is not shown to exist. The valid methodological reasons for which an association was not found between A9 and B7_NEW do not apply here. Upon analysis there is no reason to believe that the question is flawed in any way that could be used to explain the absence of such a relationship. This finding acts to demonstrate the complexity of the attitudes and behaviour being modelled here, and would appear to suggest that a further study in which commitment is the only factor under investigation, and in which a greater number of items can be devoted to its measurement, is necessary before concrete conclusions can be made.

Successful networks were characterised no more frequently than their less successful counterparts by network members who pursued communitarian as opposed to individualist motives. When statement A36 ("All network members are prepared to be flexible and make personal sacrifices, if such sacrifices benefit the network as a whole") was cross-tabulated against the network success variable (B7_NEW) it was not found to be significantly related to it. There is no additional evidence therefore from analysis of contingency tables relating to these two variables to support the rejection of the null hypothesis and acceptance of alternative hypothesis nine. The absence of such a relationship would appear to suggest that a network is no more likely to succeed or fail if members entering it are pursuing collectivist goals, than it is if they are motivated by self-interest. This finding has significant implications for actors who are seeking to maximise network interest and growth. It is likely that these actors will enjoy greater success in approaching potential new members if they advocate membership as an extension of self-interest, than they would if they did so on the basis of collectivist or communitarian grounds. Given that there is no evidence to suggest that networks in which members are

driven by self-interest are more or less likely to be successful, such a recruitment strategy would appear to be appropriate.

A relationship was identified between the length of time for which a respondent had been a member of their network (B1_NEW) and the perceived success of the network (B7_NEW). Broadly speaking, the longer an individual had been a member of the network, the greater their likelihood was of indicating that the network had succeeded in achieving the objectives set for it. The only exception to this rule appeared to be members who had been affiliated to the network for between thirteen and twenty four months. A greater proportion of these individuals than expected indicated that the network had not been successful, or could be described as, neither successful or unsuccessful. This finding seems entirely reasonable, one would expect to see a relationship between the period for which an individual had been a member, and the extent to which they believed the network to be successful. Why else would an actor continue to pay subscriptions year on year? It is only if the respondent feels that the cost of membership is too small to justify leaving, or if they anticipate benefits in the future, which have not yet been realised, that a contrary result could be expected. This finding has significant implications for the interpretation of results outlined here. If, as now seems reasonable, it is assumed that individuals are only likely to remain as members of the network if they feel that it is currently successful, or that it is likely to be successful in the future, the results obtained here (and indeed from any future network research that employs the same methodology) are inherently skewed towards successful networks. Individuals who believe that the network is not successful are therefore, likely to be under-represented within any given network. Future researchers should bear this in mind when constructing their own network research methodology. Two possible solutions which might be employed to redress this inherent bias are the interviewing and or surveying of individuals who have left the network and a longitudinal

ethnographic study in which the researcher or researchers would be able to identify disillusioned members (or ex-members) and determine the reasons for which they are or were so affected.

Five other measures of commitment were included in the questionnaire that sought to measure respondents' commitment to general co-operative activities (C5_NEW). B6A_NEW sought to measure the percentage of annual turnover that respondents committed to the network; B6BI_NE which measured the percentage of manufacturing capacity which were employed for co-operative purposes; B6BII_NE which measured as a percentage the proportion of the labour force which were employed for co-operative purposes; B6BIII_N which measured the percentage of fixed overheads which were employed for co-operative purposes, and B6BIV_NE which measured as a percentage the proportion of variable overheads which were employed for co-operative purposes. The results derived from cross-tabulating these items and variables C1 (the number of hours a respondent spends in a typical week developing new contacts) and C2 (the number of hours a respondent spends in a typical week maintaining existing contacts) against variable C5_NEW which sought to measure the success of respondents co-operative activities as a whole are summarised in Table 8.11.

Table 8.11 – Chi-square results for Co-operative Success (C5_NEW) by Non-network specific commitment variables

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
B6A_NEW	6	1.509	4 of 12 (33.3%)	94	0.19252
B6BI_NE	4	0.057	6 of 9 (66.7%)	130	0.64253
B6BII_NE	4	1.077	3 of 9 (33.3%)	123	0.64157
B6BIII_N	4	0.326	5 of 9 (55.6%)	124	0.55304
B6BIV_NE	4	0.386	5 of 9 (55.6%)	126	0.90620
C1_NEW	8	0.727	5 of 15 (33.3%)	70	0.21634
C2_NEW	8	0.769	5 of 15 (33.3%)	71	0.07027

None of the variables used to measure resources (i.e. B6A_NEW, B6BI_NE, B6BII_NE, B6BIII_N and B6BIV_NE) were correlated with respondents' perception of the success of their co-operative activities as a whole (C5_NEW). This is perhaps a reflection of the types of business sampled. The vast majority of respondents included in this sample were owner-managers of firms operating in the service sector. Question B6 was originally included in the questionnaire as a means of measuring respondents' commitment to a specific manufacturing based network. Despite the fact that the chief executive of this network approached the researcher with a view to gaining research of the type collected using the second standardised postal questionnaire, when it came to the administering of the survey within their network, they ultimately decided not to co-operate. The question was left in the survey however, as it was envisaged that in a manufacturing context a relationship between these factors and a respondents' perception of the success of their co-operative activities as a whole might well exist. It was therefore included in the survey as an item which might be tested as part of future research, and which could possibly identify significant relationships in the networks reported here.

It was recognised that question B6 was likely to be irrelevant for a significant proportion of respondents. Respondents were therefore asked in the covering letter which was administered with the questionnaire to omit or run a line through any questions that they felt were not appropriate to their circumstances. The high number of missing observations for this question (between 94 and 130) would appear to suggest that in many cases this question was viewed as irrelevant or inappropriate. This contention is supported by comments offered by respondents (a full listing of which is provided in appendix IV), in which a number indicated that they felt that some of the questions or statements made did not relate to their own circumstances. A member of the PPS hotel and guesthouse network

provides an example of such a comment:

"Many of the questions seem inappropriate to our particular circumstances. It would appear that the survey is designed for a more general audience e.g. 'Location of Business (County)'. For PPS members this is already nown more specifically." (*Sic*).

In relation to the amount of time respondents were prepared to commit to the development of (C1_NEW) and management of (C2_NEW) their co-operative activities the research indicates that only the management variable is significantly related to the respondents' perceptions of the success of their co-operative activities. Respondents who indicated they were affiliated to a successful network spent a greater number of hours per week than expected managing their co-operative relationships. Whereas individuals who described their network as unsuccessful, or were not able to categorise it as either successful or unsuccessful, spent less time managing their co-operative relationships than would have been expected if no association existed between the variables. It would appear reasonable then to surmise that individuals who devote a significant amount of time to their co-operative activities are more likely to enjoy successful co-operative relations than those that do not. However, an alternative conclusion is that, actors who indicate that they spent a lot of time managing their personal network are more likely to justify the opportunity cost of spending their time in that way, by stating that the time is well spent, and that their relationships are beneficial. Once again, it is only through further research that it would be possible to draw concrete conclusions with regards to the direction of this relationship.

To conclude then, the commitment measures summarised here offer only limited support for the rejection of the null hypothesis and acceptance of alternative hypothesis nine. Although, several of the measures have been shown to be related to network success (A14, A30 and B1_NEW), and one (C2_NEW) correlates with respondents' perceptions of the success of their co-operative activities as a whole, not all of the commitment measures

included in the second standardised questionnaire have been proven to be significant. The existence of sometimes contradictory results, for example A9 by B7_NEW and A30 by B7_NEW, would appear to suggest that the relationship between commitment and network / co-operative activity success if it exists at all is a complex one. It is only through further research that it will be possible to draw concrete conclusions. The evidence presented here would suggest that such a relationship does indeed exist, and is worthy of detailed future investigation. As has already been suggested, a longitudinal study, preferably of the ethnographic variety, probably lends itself most readily to this sort of investigation. It is only really through active participation in a network, or a number of networks, that it will be possible to assess the affect of commitment on network success. By monitoring network participants, and their time and resource inputs from the inside, it will be possible to draw more holistic conclusions, which may well go further towards the provision of a detailed model of members' attitudes and their effect on their behaviour and network success. It is only by investigating business networks from the inside that it will be possible to form a valid and useful model of best practice.

H10: Interpersonal relationship factors which exist between participants will influence owner-manager's perception of network success.

Table 8.12 outlined below summarises chi-square results derived from cross-tabulating the network success variable (B7_NEW) by interpersonal relationship variables, such as the extent to which the respondent felt they shared things in common with other members (A2) or the frequency with which they communicated with other members (A7).

Table 8.12 – Chi-square results for Network Success (B7_NEW) by Interpersonal Relationship Variables

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
A2	4	1.631	2 of 9 (22.2%)	150	0.11008
A4	4	2.049	2 of 9 (22.2%)	151	0.78822
A5	4	2.885	2 of 9 (22.2%)	149	0.63218
A7	4	2.355	2 of 9 (22.2%)	146	0.00793
A10	4	2.691	3 of 9 (33.3%)	159	0.08372
A12	4	0.453	4 of 9 (44.4%)	147	0.87250
A15	4	1.579	3 of 9 (33.3%)	177	0.00317
A16	4	0.443	5 of 9 (55.6%)	174	0.00419
A18	4	0.414	4 of 9 (44.4%)	166	0.01922
A19	4	3.158	2 of 9 (22.2%)	158	0.39605
A20	4	1.066	5 of 9 (55.6%)	177	0.41746
A23	4	0.871	4 of 9 (44.4%)	152	0.98395
A25	2	1.257	3 of 6 (50.0%)	148	0.00513
A27	4	1.020	4 of 9 (44.4%)	155	0.18866
A28	4	0.652	5 of 9 (55.6%)	161	0.01269
A31	4	1.653	2 of 9 (22.2%)	155	0.58162
A32	4	0.632	4 of 9 (44.4%)	158	0.07642
A34	4	0.200	4 of 9 (44.4%)	163	0.07651
A35	4	1.780	2 of 9 (22.2%)	162	0.70515
C7	4	0.699	4 of 9 (44.4%)	150	0.38283
C8_NEW	4	1.882	2 of 9 (22.2%)	151	0.22116

Of the twenty-one items which were included in the questionnaire as measures of interpersonal factors, nine were found to be significantly related to a respondent's perception of the network's success: A7, A10, A15, A16, A18, A25, A28, A32 and A34. The interpersonal relationship category was a broad one, which included factors which sought to measure the affects of intra-network: communication (A7, A12 and A32), allocation of associated costs (A18), power (A4, A5, A10, A19, A23, A31 and A34), member's attitudinal heterogeneity (A2), collectivism (A27), conflict (A16, A20 and A28) and opportunism (A35).

Communication

Of the three variables that were included in the survey as communication measures, two

were found to be significant at the ten percent level: A7 which measured the frequency with which members communicated with one another, and A32 which was a measure of the frequency with which meetings were held, and the level of attendance they received. Respondents who indicated that they communicated with other network members on a regular basis (A7) were more likely to indicate that the group had been successful in achieving the objectives set for it, than those individuals who indicated that their communication with fellow members was infrequent. A statistically significant relationship did not exist between communication formality and network success. A network was no more likely to be categorised as successful where communications were informal (A12), than it was where they were not. Statistical evidence was also provided to suggest a relationship between the frequency with which network meetings were held, the attendance they enjoyed (A32), and the degree to which the network could be said to be successful. Respondents were more likely to indicate that their network had been successful when they disagreed with this statement than when they did not. Once again however, as with statement A9, statement A32 is not so much one statement as two, the first of which is "Network meetings are rarely arranged", and the second being "and when they are, are poorly attended". Of course it is entirely possible that a respondent might agree with the first part A32 whilst disagreeing with the second part, or vice versa. The result derived here should therefore be viewed as unreliable, the drawing of concrete conclusions should therefore be postponed until such a time as it is possible to test for the existence of a relationship using the two component parts of the statement as two independent variables.

Allocation of network costs

A significant relationship was shown to exist between the degree to which the costs of

running the network could be said to have been split fairly between its members (A18), and the success it enjoyed (B7_NEW). Where a respondent indicated that costs had been split fairly between the network's members, they were more likely to indicate the network had been successful. Where they indicated that costs had not been allocated fairly, they were more likely to indicate that the network had been less than successful.

Power Usage

Seven items were included in the survey as direct or indirect measures of power usage within the network. Of these seven, only two, A10 and A34 proved to be significantly related to network success. Whether "all members contributed something" (A4), whether all members had equal influence in the setting of network goals and objectives (A5), whether the skills and resources the respondent brought to the network would be difficult to replace (A19), whether the respondents own firm was deemed to have a significant affect on the networks success (A23) or whether a single individual's personality or objectives dominated the network (A31) was not important, as none of these factors had a significant effect on a network's success propensity.

Results derived from cross-tabulating statement A10 ("The benefits realised by the network are divided fairly between all members) and network success, would appear to indicate that where benefits are split fairly between members the network is more likely to succeed where they are not. This said, several more respondents than expected indicated disagreement with statement A10, whilst at the same time they suggested that it had been successful in achieving the objectives set for it. Given the comparatively small number of respondents that completed both question A10 and B7_NEW (one hundred and one), it is not possible to determine whether this finding can be attributed to rogue respondents, or a

genuine pattern in the data at this end of the scale. It is only through re-testing for an association with another sample that a satisfactory answer to this query can be provided.

Respondents who agreed with the statement A34 ("No single individual uses their firm's power in terms of market share, turnover, etc to dominate the group") were more likely than expected to be affiliated to groups which could be classified as successful, whilst individuals who were unable to agree were more likely to be members of networks which had been less successful in achieving the objectives set for them.

Member Attitudinal Heterogeneity

Although a statistically significant relationship could not be supported at the ten percent level, between the extent to which respondents believed they held things in common with other members of the group (A2) and network success, it was approaching significance (p. = 0.11008). Respondents who indicated that they agreed with the statement were more likely to characterise their network as successful than those who were not able to agree. The fact that the relationship is approaching a significant level and 'bubbling under' in this way would appear to suggest that a relationship between the two variables might well exist. With refinement or a larger sample the attitudinal heterogeneity item could well prove to be significant.

Collectivism

A statistically significant relationship was not found to exist between network success and respondents' motivation for participating in the network. Respondents who indicated that all members of the network were pursuing collectivist as opposed to individualist goals

were no more likely to indicate the network had been successful than those who had not. Network managers and brokers should bear this in mind when appealing to potential new members. A collectivist approach is no more likely to result in network success, than an approach that appeals to potential members' self-interest. Given that the latter appeal is likely to be more effective in network recruitment terms, it would seem reasonable to employ it in place of a collectivist approach where network managers could expect to encounter greater resistance.

Intra-network conflict

Of the three items that were included in the questionnaire as potential measures of intra-network conflict, two proved to be significantly related to network success (B7_NEW), A16 and A28. Individuals who indicated that conflict between members was rare (A16) were more likely to indicate that their networks had been successful, whilst respondents who were not able to agree indicated on a higher number of occasions than expected that the network had been less than successful in achieving the objectives set for it.

Whether all views and opinions were expressed and discussed before any decision was made was not relevant to network success. Groups were no more likely to be characterised as successful if their members felt that that all views and opinions had been expressed and discussed than they were if they were if they felt that they had not.

The level to which respondents were able to agree with statement A28 ("The group rarely makes decisions that go against my wishes") clearly affected their perception of network success. Respondents who agreed that the network rarely made decisions which went against their wishes were more likely to indicate that the network had been successful, than

those who did not hold such an opinion.

Opportunism

Networks which had members who were acting opportunistically, by seeking to exploit other members in which ever way they could (A35), were no more likely to be categorised as unsuccessful than those which did not possess such individuals.

Preferred gender of co-operative party, and the personal network gender composition

Although a significant relationship was not found to exist between respondents gender preference (if they had one) and the gender composition of their personal network, and the perceived success of their group based activities, this was not the case when it came to assessing their co-operative activities as a whole. A statistically significant relationship was shown to exist between the preferred gender of co-operative parties and the level of co-operative success enjoyed. However, the relatively small number of respondents who indicated a preference for co-operation with one gender was relatively small in relation to the number who indicated no preference. It is therefore likely that the results obtained can be attributed to statistical chance, or the high number of respondents who were affiliated to the Women in Business network, which might perhaps be more accurately classified as a support network. It is likely that a different result would be obtained if all of the networks were business driven. The direction of this 'apparent' relationship is interesting though, and is certainly worthy of further empirical investigation. The results presented here suggest that respondents who would prefer to co-operate with males are more likely than expected to describe their networks as unsuccessful, whilst a higher than expected number of respondents who indicated a preference for female co-operative partners indicated that

they were affiliated to a successful network.

Table 8.13 – Chi-square results for Co-operative Success (C5_NEW) by relevant Interpersonal Relationship Variables

Variable Name	Degrees of Freedom	Minimum Expected Frequency	Cells with F. less than 5	Number of Missing Observations	Significance
C7	4	0.321	6 of 9 (66.7%)	141	0.01745
C8_NEW	4	0.964	4 of 9 (44.4%)	141	0.49722

Analysis of the contingency tables relating to interpersonal relationship factors and network success (B7_NEW) has indicated the existence of a number of statistically significant relationships. Network success has been shown to be correlated with network communication, resource allocation, power usage and network conflict. Networks which were characterised by good communication between members or fair resource allocation were more likely to enjoy success than those in which communications were poor or resource allocation less than fair. In contrast, networks in which power was exerted or abused by its members, or in which conflict was high were more likely to be classified as unsuccessful.

These results have obvious implications for network brokers and managers. Parties seeking to maximise network success should concentrate on minimising the potential for abuse of power or power asymmetries, aim to minimise network conflict, and maximise network communications and fair resource allocation.

The findings discussed above indicate that there is sufficient evidence available to reject the null hypothesis in favour of alternative hypothesis ten in which it was postulated that

interpersonal relationship factors which exist between network participants would affect respondent's perception of network success.

As has already been elucidated at length above, these results must be interpreted with caution. The number of cells with a frequency of less than five exceeds the conventional threshold of twenty percent of the total in the vast majority of relationships discussed. In many cases the number of cells with a frequency of less than five is dangerously close to one hundred percent. Although convention statistical wisdom suggests that these relationships should be rejected, such correlations have not been discarded here. Given that the aim of this research study was essentially an exploratory one, in which the researcher sought as much as anything to draw attention to the dearth of empirical network research, and the inadequacies of studies conducted to date. The failure of this research programme to draw any firm conclusions reflects the state of this research field, as much as specific methodological failures on the part of the researcher. Empirical network research prior to this study was focused for the most part on little more than counting exercises, in which researchers were only able to comment on the characteristics of specific networks. As no attempt was made at establishing relationships between variables, it was not possible to determine the likely causes of the behaviour patterns identified. The value of these studies outside of the specific study on which they commented was therefore highly limited. The research programme reported here sought to address these issues, the fact that it has not done so entirely successfully should not be viewed too critically. By drawing other researchers' attention to the erroneousness of existing empirical research, and by outlining a possible way forward for the field, it should act to realign network research, along an ultimately more productive and laudable path.

The above caveats aside, the second standardised postal questionnaire has produced a list

of possible relationships for investigation as part of future research. The sheer number of variables which were significantly related to network membership should in themselves be enough to accept hypothesis seven (Owner-manager and network behaviour will vary between groups). This finding has significant implications for network research and practice. A single management process model, or government or business support solution will not suffice. Even within the comparable networks studied here, significant behavioural and demographic heterogeneity was evident. The nine networks studied as part of this research programme can be adequately characterised as low intensity low formality networks, as classified by the Intensity-Formality matrix detailed in Chapter Two. It seems reasonable then to assume that network behavioural diversity will be even greater when comparisons are made between networks which belong in different cells on that matrix. The existence of network heterogeneity, and the inadequacy of a single strategic approach to network initiation and management refocuses attention on the importance of network brokers, leaders and managers, and the need for careful recruitment of, and training of these individuals, when the networks with which they are involved are of central importance to the local economy, or where they are employed by the public sector.

Chapter Nine - Summary, Conclusions and Further Research

9.1 Research Summary

The research programme reported here initially sought to familiarise the reader with the literature bases relating to networking – co-operation, personality psychology, commitment and trust research. As has been noted on a number of occasions throughout the review, and subsequent discussion, theoreticians operating in these fields are drawn from, and publish in a number of different disciplines. The literature review presented in this thesis seeks only to identify the most important and pertinent sources, and those which have been used to guide hypothesis formation, and which are best able to put the empirical work conducted into context.

The first phase of empirical research summarised here, centres around the examination of the effect of an owner-manager's personality and membership of business clubs on their propensity to co-operate with others. Univariate chi-square results are discussed in relation to competitor co-operation (the area of inter-firm research which has been most theoretically and empirically impoverished), and a multivariate logistic regression model extended as an explanatory tool to assist understanding of it. Co-operative propensity logistic regression models are also extended for the other five types of co-operation examined namely general, customer, distributor, supplier and consultant co-operation. Owner-manager personality is also investigated as a possible antecedent to and explanatory tool for determining why some individuals enjoy greater co-operative success than others. This leads into a discussion of some of the principal findings, and their implications for existing inter-firm co-operation and network support.

The second phase of empirical research was focused on non-personality / attitudinal antecedents to co-operative, or more specifically network success. Responses elicited from individuals associated with nine business related groups (which could be best characterised as low intensity – low formality on the Network Intensity Formality Matrix) are analysed, and used to determine the effects of respondent commitment, trust, inter-network communication, network formality and inter-personal relationship factors on networks success. Once again this leads into a representation of pertinent hypotheses and a discussion of some of the principal findings, and their implications for existing inter-firm co-operation and network support.

The chapter closes with an identification of the main limitations of this research, and provides caveats for its use or interpretation by other researchers. This discussion leads into a consideration of the gaps which still need to be filled in network research, if a true empirical understanding of inter-firm co-operation is ever to be achieved. An agenda is thus set for future research, with areas that still require considerable empirical investigation being identified. The chapter closes with a representation of some of the key results outlined elsewhere in this document, and their implications for academics and practitioners.

Results presented in detail in the preceding chapters are summarised briefly below, before the research hypotheses are represented, and conclusions relating to them are discussed.

A number of antecedents to business co-operation were identified, with owner-manager's personality based attitudes being the most noteworthy at both the uni-variate and multivariate levels. In the interests of research validity and as a means of overcoming past

methodological flaws in co-operation research a polymorphous definition of co-operation was advanced and tested. Significant univariate relationships and logistic regression models were constructed for all of the identified types of co-operation, namely: general co-operation (a measure of whether respondents had co-operated with anyone at any level); competitor co-operation; consultant co-operation; customer co-operation; distributor co-operation and supplier co-operation.

Findings presented in the first phase of research clearly identified the importance of owner-manager's personality related attitudes as determinants of their co-operative behaviour at all levels. In addition, other antecedents were also identified, with respondent's affiliation to business related groups being most frequently related to their propensity to co-operate with others. Other variables that were found to be similarly important included the type of business that the respondent operated (i.e. primary sector, secondary sector or tertiary sector based); the number of business related groups that they were members of; their original motive for founding the business (e.g. a desire to be their own boss, or inherited the business); the number of employees the firm retained and the county in which the firm was based.

The second phase of the research sought to identify factors which differentiated firms who enjoyed success in the networks to which they were affiliated from those who did not. Results presented initially clearly indicated the heterogeneous nature of business networks, thereby presenting significant evidence for the need to create strategies which reflect the variable nature of business networks. Networks identified by their members as being successful were generally characterised by greater inter-firm trust; greater commitment to the network; more frequent and better quality communication between members; equitable

cost allocation; no / low power differentials between members and low intra-network conflict.

No evidence was presented to support the existence of relationships between poor network performance / failure and the performance of respondent's firms; member's attitudinal heterogeneity; opportunism or the existence of individualist as opposed to collectivist behaviour within the group.

9.2 Research conclusions

The following section offers conclusions based on this research programme. Conclusions drawn from the research and their implications are discussed on a hypothesis by hypothesis basis. This discussion then leads into the presentation of a co-operative interaction model which seeks to unravel some of the contents of traditional 'black box' conceptualisations of business networks, in which the inputs and outputs may be known, like the components and end product on a production line, but where the stages in between remain unexplained or unexplainable.

9.2.1 H1: Co-operative propensity is affected by an owner-manager's personality

Just over seventy seven percent of respondents were found to have co-operated with at least one party in at least one way. If co-operation is viewed atomistically (i.e. at the co-operative type level), it becomes apparent that 29.97% of respondents co-operated with their competitors, 25.73% co-operated with consultants, 49.84% co-operated with customers, 24.76% with distributors and 49.19% with their suppliers.

What is apparent from a holistic analysis of the results, is that personality antecedents vary significantly from one type of co-operation to another, whereas a variable may prove to be highly significant for competitor co-operation (for example variable D18 - "If there is a risk involved in a course of action I will think it through thoroughly"), it may be entirely insignificant when determining the likelihood of an individual co-operating on other propensity bases. There is therefore undoubtedly a need to consider co-operation as a polymorphous entity which should be viewed, researched and analysed not *en masse* as it has been to date, but as a heterogeneous construct which can only be meaningfully viewed at the individual atomistic – typological level.

The Durham Business School Personality Instrument failed in its capacity to group items into the nine personality dimensions it was designed to test, namely: need for autonomy; networking (seeking the advice and guidance of others); need for achievement; creativity; opportunism; locus of control; vision; attitude to risk and risk strategy. As has already been discussed at some length, a decision was taken not to reject the test, but rather to analyse the data at the individual item level. Analysis in this way revealed significant relationships between attitudes held by respondent owner-managers, and their propensity to co-operate with others, and the co-operative success they enjoyed. Attitudinal antecedents differed significantly between the different types of co-operation. For example, an individuals response to item D38 ("I exclude others from decisions which affect the running of my business") was a good indicator of a respondents propensity to co-operate with their customers, but was of no assistance when trying to determine their propensity to co-operate in other capacities. Results relating to attitudinal antecedents and co-operative type are summarised in tables 9.1 and 9.2. Table 9.1 is a condensed version of results relating to chi-squared Univariate relationships, table 9.2 performs a similar role in reporting multivariate logistic regression results.

Table 9.1 - Summary of Attitudinal Antecedents to Co-operative Propensity (Univariate significant relationships only)

	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
D1	.09090	.03254	-	.04780	-	-
D2	-	-	.02135	-	-	-
D4	.02005	.08670	.09625	-	.01129	.01577
D5	-	-	.01613	-	-	-
D7	-	-	-	.08109	-	-
D8	-	-	-	.09507	.0990	-
D10	.08753	-	.05374	-	-	-
D11	.00714	-	-	.02330	-	-
D15	.03604	-	-	.04197	-	-
D18	-	.04668	-	-	-	-
D19	-	-	.04573	-	-	-
D22	-	-	-	-	.06086	-
D23	-	-	-	.02986	.06644	-
D24	-	-	-	-	-	.09093
D25	-	-	-	-	.09509	-
D26	-	-	-	.08791	-	-
D28	.03362	.08670	-	.01660	-	-
D29	.00072	.01360	-	.02841	-	.06188
D30	.06729	-	-	-	-	-
D32	-	-	.07411	.09630	-	-
D33	-	-	-	.01613	-	.04018
D34	-	-	-	.09251	.03998	-
D35	-	.04554	-	.08186	-	-
D36	-	-	.03085	-	-	.06650
D37	-	-	-	-	.02790	-
D38	-	-	-	.09468	-	-
D43	.02653	-	-	-	-	-
D45	-	-	-	-	.04204	-
D46	-	-	-	-	-	-
D47	.06910	-	-	-	-	-
D48	-	-	-	-	-	-
D49	.07688	-	-	-	-	-

Key: "-" = Variable insignificant

Table 9.2 - Summary of Attitudinal Antecedents to Co-operative Propensity - Logistic Regression Exponent Beta Scores

Variable Name	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
D2 – ACTIVELY SEEK OPINIONS OF OTHERS						
Not at all			2.68			
Somewhat	NS	NS	0.65	NS	NS	NS
Moderately so			0.32			
Very much so			1.81			

D4 – ABLE TO GENERATE IDEAS WHEN I NEED TO						
Somewhat	0.48	NS	0.25	NS	0.39	NS
Moderately so	3.10		1.98		1.94	
Very much so	0.67		2.04		1.33	
D11 – WILLING AND ABLE TO LISTEN TO OTHERS						
Not at all	0.74	NS	NS	NS	NS	NS
Somewhat	0.24					
Moderately so	3.63					
Very much so	1.54					
D15 – BELIEVE BUSINESS IS INFLUENCED BY ECONOMY ...						
Not at all	0.0016	NS	NS	NS	NS	NS
Somewhat	8.68					
Moderately so	6.13					
Very much so	11.84					
D18 - THINK DECISIONS THROUGH						
Not at all						
Somewhat	NS	0.36	NS	NS	NS	NS
Moderately so		2.67				
Very much so		1.06				
D19 – UNCOMFORTABLE WITH IDEA OF RUNNING BUSINESS						
Not at all	NS	NS	215.91	NS	NS	NS
Somewhat			599.80			
Moderately so			0.0000			
Very much so			559.39			
D23 – KNOW HOW TO CONVERT OPPORTUNITIES INTO SUCCESS						
Not at all	NS	NS	NS	NS	128.83	NS
Somewhat					0.23	
Moderately so					0.11	
Very much so					0.30	

D29 - REJECT ADVICE / GUIDANCE Not at all Somewhat Moderately so Very much so	NS	12.30 34.95 2.63 0.0009	NS	NS	NS	NS
D30 – FOUND IT DIFFICULT TO ACHIEVE GOALS Not at all Somewhat Moderately so Very much so	1.30 4.86 0.77 0.21	NS	NS	NS	NS	NS
D33 –BELIEVE IT IS DIFFICULT TO CONTROL BUSINESS Not at all Somewhat Moderately so Very much so	NS	NS	NS	NS	1.36 2.06 0.85 0.42	NS
D35 - EFFECTIVELY EVALUATE RISKS Not at all Somewhat Moderately so Very much so	NS	0.0035 1.69 8.65 19.31	NS	NS	NS	NS
D47 – OFTEN IGNORE ADVICE AND GUIDANCE OF OTHERS Not at all Somewhat Moderately so Very much so	1.92 0.20 2.18 1.17	NS	NS	NS	NS	NS

Key: "NS" = Variable not significant

These findings provide overwhelming support for hypothesis one (Co-operative propensity is affected by an owner-manager's personality), and suggest that any approach which is

driven by a desire to increase owner-manager's co-operative propensity *per se* is likely to be flawed. It is only through consideration of co-operation at the *atomistic* (individual co-operative type) level, that it will be possible to produce viable strategies for fostering, facilitating and managing greater inter-business co-operation in the local economy. Academics and practitioners alike may therefore find that there is considerable mileage in considering inter-firm linkages in this way, with the by-product of such consideration being a greater co-operative dividend for both participant firms and the local economy as a whole.

9.2.1.1 The Relationship between co-operative types

Results presented here suggest that although the individual antecedents to the various types of co-operation differ, both at the attitudinal and non-attitudinal levels, there is a need to view these co-operative types as potential antecedents in themselves. At the Univariate level, it was found that without exception a relationship exists between all co-operative types. A respondent who co-operates with his/her competitors for example, is more likely to co-operate in other capacities (e.g. with suppliers, customers, etc.), than other individuals who have not. However, when the data is modelled using backward elimination logistic regression (a multivariate technique) co-operative type rarely appears in the final model, thereby suggesting that although it is a significant indicator at the Univariate level, when considered through multivariate analysis, there are other variables which prove to be more significant antecedents to co-operative propensity.

This finding acts to illustrate the complexity of business co-operation research. Results presented here suggest that it would be wrong to consider an individual's co-operative propensity *en masse*, but at the same time it would be wrong to suggest that the different

types of co-operation are mutually exclusive, as clearly they are not. Individuals looking to foster competitor co-operation (or indeed any other type of co-operation) would be well advised to bear these findings in mind, and should look to potential co-operative parties relative co-operative propensities in other areas. If an individual already co-operates with their customers, suppliers and distributors, they are likely to be more amenable to the prospect of co-operating with their competitors, than their counterparts who have no co-operative linkages.

9.2.2 H2: Co-operative propensity is affected by the owner-manager's membership with regards to business related groups

The vast majority of respondents were affiliated to at least one business related group, only 20.16% were attached to no groups at all. Over seventy percent (71.34%) were members of a trade associated, just over a quarter (26.06%) were attached to a Chamber of Commerce, 11.73% were affiliated to a business club, less than two percent (1.63%) indicated that they were participants in a strategic alliance, and just over five percent (5.21%) identified themselves as members of the Freemasons.

Results presented in chapters six, seven and eight of this document would appear to indicate that members of these groups possess higher co-operative propensities than non-members, although it has been shown that antecedent business group(s) vary by co-operative type. For example in the case of competitor co-operation the only group that was found to be significantly related to co-operative propensity was membership of a trade association, members were shown to be 7.38 times more likely to co-operate with their competitors than their non-member counterparts. For customer co-operation Freemason membership was shown to be an antecedent, with individuals affiliated in this way being

5.59 times more likely to co-operate with their customers than those who were not. Logistic regression models run for general, consultant, distributor and supplier co-operation would appear to indicate that membership of a business related group is not an antecedent to co-operative propensity in these areas. Results relating to co-operative type and business group membership are summarised in tables 9.3 and 9.4. Table 9.3 is a condensed version of results relating to chi-squared Univariate relationships, table 9.4 performs a similar role in reporting multivariate logistic regression results.

Table 9.3 - Summary of Univariate statistics relating to Co-operative Propensity and Business Club Affiliation

Co-operative Type	Business Club	Chamber of Commerce	Freemasons	Trade Association
General	-	-	-	-
Competitor	.00935	-	-	.05835
Consultant	.00332	.01859	-	-
Customer	-	-	.07441	.00181
Distributor	-	-	-	-
Supplier	-	-	-	-

Key: "-" = Variable insignificant

Table 9.4 - Summary of Logistic Regression Exponent Beta Scores relating to Co-operative Propensity and Business Club Affiliation

Co-operative Type	Business Club	Freemasons
General	-	-
Competitor	7.38	-
Consultant	-	-
Customer	-	5.59
Distributor	-	-
Supplier	-	-

Key: "-" = Variable insignificant

Taken in conjunction with results presented relating to the number of business groups to which an individual was affiliated (individuals who were members of more than one group frequently displayed higher co-operative propensities) the findings presented above, and elsewhere in this document provide overwhelming evidence in support of alternative

hypothesis two (Co-operative propensity is affected by the owner-manager's membership with regards to business related groups). Although it is not possible to determine the direction of this relationship, that is to say whether individuals who are members of such groups co-operate more as a result of membership, or whether they possess a higher co-operative propensity before joining these groups, such an answer at least from a network broker's or facilitator's perspective is largely of academic interest. Actors seeking to maximise inter-firm co-operation would therefore be well advised to use these groups as one of their principal hunting grounds.

9.2.3 H3: Co-operative propensity is affected by the owner-manager's demographic characteristics

Results derived from analysing cross-tabulations relating to individual's demographic characteristics and their co-operative propensities were mixed, only one of the characteristics measured through the first questionnaire, the respondent's sex, proved to be statistically significant. Analysis of the results indicated that male respondents were more likely to co-operate at the general or competitor level than their female counterparts. What is not clear however, is whether female owner-managers are prohibited from such groups, or are simply less willing or interested in participating in such activity. If the finding presented here is upheld by results obtained through administration of the same research instrument on a larger sample, or one in which the sexes are equally balanced (female respondents account for little more than seven percent of this sample), network brokers and leaders can use such information as a means of targeting their facilitation activities more effectively. However, the issue becomes one of whether increased efficiency leads to a reduction in the quality of the output derived. If as is arguable, focusing co-operative

support activities on male owner-managers leads to a general reduction in network diversity / heterogeneity, such action may well be ill advised. Unfortunately, network diversity was not one of the areas of principal concern in this research programme so conclusions relating to it cannot be made. Further examination of the gender – co-operative propensity relationships on the basis of results presented here may though prove both enlightening and rewarding. Partial support can therefore be given to hypothesis three - Co-operative propensity is affected by the owner-manager's demographic characteristics as it serves to identify the existence of a possible relationship which could be examined in more detail as part of a more targeted research programme.

9.2.4 H4: Co-operative propensity is affected by firm's demographic characteristics

Turning to firm demographics and co-operative propensity, the results indicate that three of the five measures were significant, the number of employees that the firm retains, the sector in which the business operates and the county in which it is based. Univariate results relating to firms' demographic characteristics and their owner-manager's co-operative propensity are summarised in Table 9.5. Multivariate logistic regression results are presented in Table 9.6.

Table 9.5 - Summary of Univariate statistics relating to firm demographics and co-operative propensity

Variable Name	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
Bustype				.00087		.01701
County			.03287			
EmployN2		.09236	.02957			.04413

Key: "-" = Variable insignificant

Table 9.6 - Summary of Multivariate logistic regression exponent beta scores relating to firm demographics and co-operative propensity

Variable Name	General Co-operation	Competitor Co-operation	Consultant Co-operation	Customer Co-operation	Distributor Co-operation	Supplier Co-operation
TYPE OF BUSINESS						
Agricultural & Extractive	NS	NS	NS	0.23	NS	2.27
Manufacturing				4.06		0.36
Service Sector				1.07		1.21
COUNTY IN WHICH THE FIRM IS BASED						
Avon			0.74			
Cornwall			0.90			
Devon			1.57			
Dorset			0.65			
Somerset	NS	NS	0.0001	NS	NS	NS
Wiltshire			2.11			
South Glamorgan			0.0000			
Gloucestershire			7.17			
Oxfordshire			21274.72			
Gwent			1147.26			
NUMBER OF EMPLOYEES						
0 - 2.99 Emps.		2.40				
3 - 5 Emps.		1.28				
6 - 7 Emps.		4.37				
8 - 9 Emps.		0.78				
10 - 14 Emps.		0.15				
15 - 19 Emps.	NS	1.14	NS	NS	NS	NS
20 - 24 Emps.		0.35				
25 - 29 Emps.		0.83				
30 - 49 Emps.		2.52				
50 - 99 Emps.		1.48				
100 - 249 Emps.		1.44				
250 - 3500 Emps.		0.36				

Key: "NS" = Variable not significant

As a rule larger firms were more likely to co-operate with their competitors and suppliers, although small differences from expected values were also noted for micro-firms which also displayed higher co-operative propensities. Firms operating in primary and tertiary sectors displayed a higher propensity to co-operate with their suppliers, whilst their manufacturer counterparts displayed a higher customer co-operative propensity. The 'county' variable was only significant for consultant co-operation, where it became clear that there were significantly higher levels of co-operation amongst firms based in Gloucestershire, Oxfordshire and Gwent. Sufficient evidence has therefore been obtained with which to reject the null hypothesis in favour of alternative hypothesis four (Co-operative propensity is affected by the firm's demographic characteristics).

If a public sector approach of 'picking winners' (Storey, 1992) is adopted, support staff would be well advised to consider the demographic characteristics of the firms with whom they interact. Through consideration of the three demographic variables identified above networks brokers, managers and leaders may be able to optimise the groups they establish or run, thereby achieving a significant co-operative – competitive advantage.

9.2.5 H5: An owner-manager's attitudes will influence their perception of co-operative success

Most respondents (approximately seventy nine percent) indicated their co-operative activities had been either highly or reasonably successful. Less than five percent of respondents indicated that their co-operative activities had been unsuccessful. This finding perhaps highlights one of the difficulties of using a subjective measure (the respondents' perception) of co-operative success. It is possible to argue that an individual may be

reluctant to identify areas in which they are weak, either to themselves or to others, and as a result will be inclined towards scoring themselves more highly than would have been the case had a more objective measure of co-operative success been used.

This point aside, the results presented here and summarised in Table 9.7 provide sufficient evidence with which to accept alternative hypothesis five. As has already been stated in this document, a knowledge of attitudinal antecedents to co-operative success may prove to be a double edged sword, as individuals employed to manage co-operative relations, be they public sector or group employed may recruit members who are more likely to indicate that the network has been successful, irrespective of what its actual contribution may have been in more objective terms (e.g. number of new jobs created, or increase in the firms profits). It is only through further research that uses a less subjective dependant variable that it will be possible to provide a satisfactory solution to this dilemma.

Table 9.7 - Summary of Univariate statistics relating to owner-manager's attitudes and co-operative success

Variable	Correlation Significance
D4: Generate ideas when need to	.05257
D5: Many bus opportunities to take advantage of	.01314
D14: able to take advantage of opportunities	.04074
D16: know where want products / services to be in the market future	.07773
D23: know how to convert opportunities into success	.06886
D32: able to assess changes in the environment	.07816
D34: unsure about product / service which is central to the business	.02780
D36: Contingency plan where risk exists	.00008
D48: would rather work for someone else	.08995
D52: not sure which product or service to concentrate attention on	.00595
D53: evaluate courses of action in terms of risks involved	.02353
D54: see course of action through	.09945

9.2.6 H6: The attitudes and behaviour indicated by respondents will be related to the network to which they are affiliated.

Alternative hypothesis six stated that: The attitudes and behaviour indicated by individuals will be related to the network to which they are affiliated. Results presented and conclusions drawn from them support this contention. A number of relationships existed between the network to which an individual was affiliated and other survey questions (a summary of which can be found in Table 9.8 below). Although these should be viewed with caution on an individual level, taken together (fifty one significant relationships were identified) they provide sufficient empirical evidence with which to reject the null hypothesis of no relationship. Such a finding suggests that researchers and practitioners alike should view networks and co-operative groups as individual entities in which behaviour and dynamics may vary significantly. Although it is possible to draw conclusions relating to best practice (those offered in section 9.2.13 being an example), and use them to construct a best practice model, it is important to realise that prescriptive application of such a model may be counterproductive. A hydra-conceptualisation of co-operative behaviour is therefore required, in which it is recognised that networking behaviour may differ substantially from one group to another. Such a recognition represents a significant step forward from existing co-operative research which views individual and group activity as homogeneous, and thus explainable using a single model.

Table 9.8 - Summary of Univariate statistics relating to owner-manager's attitudes and behaviour by network membership

Variable Name	Significance
Q1	0.02945
Q2	0.00010
Q6	0.01043
Q7	0.00006
Q10	0.00321
Q11	0.04401
Q12	0.09542
Q13	0.00044
Q14	0.00001
Q15	0.00071
Q16	0.00039
Q17	0.00033
Q18	0.00052
Q20	0.03502
Q21	0.01147
Q22	0.02058
Q24	0.04795
Q25	0.00017
Q26	0.01386
Q27	0.00185
Q28	0.00248
Q29	0.00000
Q30	0.00143
Q31	0.00000
Q32	0.00003
Q34	0.00129
Q35	0.00387
Q36	0.00018
B1	0.00000
B2	0.00000
B3A	0.00000
B3B	0.00011
B5A	0.00209
B5C	0.07883
B6A	0.00000
B6B_I	0.00000
B6B_II	0.00003
B6B_III	0.00000
B6B_IV	0.00000
B7	0.02500
C5	0.00209
C7	0.00672
C8	0.00000
D1	0.00000
D4_YEAR	0.00061
D4_TURNO	0.00000
D5	0.00004
D6	0.00002
D7_AGE	0.00001
D7_SEX	0.00000
D7_LOCAT	0.00000
D7_POSIT	0.00102

D8	0.00000
B7_NEW	0.07796
C5_NEW	0.02276

9.2.7 H7: The performance of an owner-manager's business will influence their perception of network success.

Of the six variables used to test alternative hypothesis seven (The performance of an owner-manager's business will influence their perception of network success) two variables full and part time staff retained were found to be significantly related to network success, with two others, the firms turnover and average profit margins bubbling under at p.=0.16379 and p.=0.13228 respectively (a full summary of the results relating to business performance and perception of network success can be found in Table 9.9). Deviations away from expected values for contingency tables relating to network success and the number of full and part time employees were small, with no clear pattern evident within them, it is therefore not possible to draw any meaningful conclusions relating to them. From research presented here then there is insufficient evidence with which to conclude that the performance of an owner-manager's business (at least in the terms measured here) impacts upon their perception of the network's success. It is therefore possible to conclude that no advantage can be gained by academics and practitioners from targeting firms and modifying the level of attention they afford them on demographic bases.

Table 9.9 - Summary of Univariate statistics relating to firm demographic variables and co-operative success

Variable Name	Significance
D1_NEW	0.53012
D2_FT_NE	0.05812
D2_PT_NE	0.09259
D4_YEAR_N	0.62862
D4TURN_N	0.16379
D6_NEW	0.13228

9.2.8 H8: The level of trust which exists between participants will influence owner-manager's perception of network success.

Eight items were used to collect data relating to alternative hypothesis eight (The level of trust which exists between participants will influence owner-manager's perception of network success). Of the eight, three items were shown to be significant, A13 ($p.<0.05$), A21 ($p.<0.05$) and A26 ($p.<0.1$). A full results summary is presented in Table 9.10. Individuals who indicated agreement with the statement that network members were more trustworthy than other business people with whom they dealt (A13) were more likely to indicate that the network had been a success. Respondents were also more likely to indicate that the network had been successful when they agreed with statement A21 – network members are sincere and honest. Finally, a network was more likely to be perceived as successful when the extent to which a respondent was prepared to trust a member was not determined by the amount of time for which they had known them. Sufficient evidence exists therefore with which to reject the null hypothesis of no relationship between intra-network trust and network success. Network brokers, leaders and facilitators should therefore strive to maximise network trust, because although this research is not able to identify the direction of this relationship (i.e. whether the existence

of trust results in successful networks, or whether successful networks foster trust) it seems reasonable to presume that networks in which trust is high are more likely to be successful, or at least will not be adversely affected by its presence.

Table 9.10 - Summary of Univariate statistics relating to trust variables and co-operative success

Variable Name	Significance
A3	0.64766
A8	0.53864
A13	0.02191
A17	0.61997
A21	0.03397
A26	0.05363
A29	0.51391
A33	0.91779

9.2.9 H9: The level of commitment which exists within the network will influence owner-manager's perception of its success.

Three of the six network commitment variables for which meaningful data was obtained were shown to be significantly related to networks success (a full results summary is presented in Table 9.11). Sufficient evidence therefore exists with which to reject the null hypothesis in favour of alternative hypothesis nine (The level of commitment which exists between participants will influence owner-manager's perception of network success). Evidence presented would though appear to suggest that the relationship between network success and commitment is a more complex one than was initially anticipated. In some instances the level of commitment to the network may lead to increased power for the committing party, which may cause others to perceive the network as unsuccessful, as the committed firm(s) drives the group in the direction which favours it the most. The argument is not that high levels of commitment will always have a damaging affect on a

network, but rather that in some instances such commitment may lead to an increase in power for one or more firms, a fact which network brokers and facilitators should be aware of if they are seeking to achieve an egalitarian network in which benefits are accrued by and shared by all of its participants. Findings reported in earlier chapters have suggested that a network is more likely to be successful when all network members are equally committed to its success. Commitment variables measured as part of this research programme add only limited support for the rejection of the null hypothesis and acceptance of alternative hypothesis nine. Although sufficient evidence is presented to suggest that network brokers, facilitators and leaders should consider member commitment as impacting on their network(s), and it would appear that the most successful networks (or at least those which are perceived as being successful) are those in which all members are equally committed to their success. Actors involved in business networks could therefore do worse than ensure that all members are equally committed to the network, and should manage the group so as to prevent some members dominating it, and by doing so limit the benefits that can be realised by others.

Table 9.11 - Summary of Univariate statistics relating to commitment variables and co-operative success

Variable Name	Significance
A9	0.52584
A14	0.01864
A22	0.41514
A30	0.09220
A36	0.75578
B1_NEW	0.00756

9.2.10 H10: Interpersonal relationship factors which exist between participants will influence owner-manager's perception of network success.

Of the twenty-one variables used to test alternative hypothesis ten (Interpersonal relationship factors which exist between participants will influence owner-manager's perception of network success) nine were shown to be significant. A network was more likely to be successful where its members communicated frequently; where meetings were organised frequently and were well attended; where network costs were divided fairly between members; where network benefits were evenly split; where no single firm used their firm's power in terms of market share, turnover, etc to dominate the group; where network conflict was rare, and where a respondent indicated that the group rarely made decisions that went against their wishes.

A potential relationship would also appear to exist between members' attitudinal heterogeneity and network success. The chi-square significance for these two variables was 'bubbling under' at p.=0.1108. A significant result might well be obtained with refinement of the question or administration of it to a larger sample. A full results summary is presented in Table 9.12.

There is therefore sufficient evidence with which to reject the null hypothesis of no relationship, in favour of alternative hypothesis ten. It is thus possible to conclude that interpersonal relationship factors do impact upon the way in which the network is perceived by its members. Successful networks tend to be those which are egalitarian, and in which members communicate with one another frequently, and where conflict is rare. Further discussion of interpersonal factors is offered in section 9.2.13 where a number of guidelines are extended for those seeking to maximise network success.

Table 9.12 - Summary of Univariate statistics relating to interpersonal relationship variables and co-operative success

Variable Name	Significance
A2	0.11008
A4	0.78822
A5	0.63218
A7	0.00793
A10	0.08372
A12	0.87250
A15	0.00317
A16	0.00419
A18	0.01922
A19	0.39605
A20	0.41746
A23	0.98395
A25	0.00513
A27	0.18866
A28	0.01269
A31	0.58162
A32	0.07642
A34	0.07651
A35	0.70515
C7	0.38283
C8_NEW	0.22116

9.2.11 Trust, Commitment and Interpersonal Factors - Correlates between the work of the IMP Group, Morgan and Hunt, and this Research Study

Rejection of the null hypotheses for hypotheses eight, nine and ten, offers further primary research support for the relationship marketing models developed and extended by the IMP group (e.g. Ford, 1998) and Morgan and Hunt (1994). In both of the above cases, the importance of trust, commitment, power, etc. were identified as determinants (or potential determinants) of relationship success.

In the case of trust, at the theoretical level researchers in the IMP group (e.g. Ford, 1990) have argued for some time that business relationships are likely to be more successful

where the parties involved trust one another. Morgan and Hunt (1994) in their primary research into relationship marketing supported this contention, and demonstrated that actors involved in a relationship were more likely to co-operate with one another if an environment of trust existed. Further quantitative support for the relationship success - trust linkage can be found in the work of Smeltzer (1997) who in his analysis of buyer-supplier relationships found that inter-actor trust was higher where parties involved were not entirely self serving, and Geyskens *et al* (1998), whose meta-analysis of trust in marketing channels demonstrated that it is one of, if not the key factor, in determining relationship satisfaction and its long term sustainability. Due to the greater breadth of this study, it has not been possible to indicate the direction of the relationship between the trust and co-operative success variables. However, evidence is presented which suggests that where co-operation between parties is deemed successful, respondents are also more likely to indicate that they trust those with whom they are co-operating. Given the causal relationship work of both members of the IMP group (Smeltzer, 1997; Geyskens *et al*, 1998) and Morgan and Hunt (1994), as cited above, it is most likely that it is the presence of trust that makes these co-operative relationships successful, rather than vice versa.

At a more specific level, Morgan and Hunt (1994) found that trust was more likely to exist if others had not acted opportunistically in the past, good communications existed between the parties and if the parties involved in the relationship shared similar values. Conversely, trust was less likely to exist where coercive power displays were evident.

The focus of the research reported in this document has been upon network success (and the affect of trust upon it), no attempt has therefore been made to explore the factors which affect relationship trust itself. Instead, the work of Morgan and Hunt (1994) was taken as a starting point, with the variables identified as affecting trust being taken as proxies for relationship trust. For example, acting opportunistically was taken as having an adverse

effect upon trust, and its effect upon network success tested. As a result it is possible to identify 'trust variables' which affect network success, but not directly support or refute the earlier work of Morgan and Hunt (1994). However, where trust was explicitly cited as existing within the network ("I trust network members far more than other business people I deal with" or "I believe that network members as a whole are sincere and honest") the network was found to be more successful. Evidence was also presented which suggests that intra-network trust is organic and grows over time ("I place greatest trust in those members of the network with whom I have had the greatest contact in the past"). No evidence was found to support a relationship between network success and the other trust variables tested (namely, "I am by nature a trusting person", "When running my business I trust no one", "My trust of other members of the group has increased significantly since we first met", "I trust other members of the network to make important decisions which affect my firm, even when I am unable for some reason to make them myself", "If an individual or company is recommended by someone I trust I will consider the individual or firm as trustworthy").

As was the case with trust the importance of commitment to relationships has been stressed in both the IMP and general networking / co-operation literature. Doucette (1997) in his study of a retail pharmacy purchasing group found that where perceived commitment of other members was low, the commitment of respondents was also low. This finding is supported to some extent by the research findings presented here. Where "All members [were found to be] equally committed to the success of the network" the network was more likely to be perceived as having been successful. Whilst support was not found for all 'commitment' variables, sufficient evidence was presented to suggest that in line with the findings of Morgan and Hunt (1994), commitment may indeed be positively correlated with co-operation. The study conducted by Morgan and Hunt (1994) suggested that where

relationship commitment existed the parties involved were more likely to co-operate with one another. In rejecting hypothesis nine, partial support for their findings can be offered. However, results presented here suggest that the relationship between network commitment and success is a complex one, and will therefore require further research before significant conclusions can be drawn.

Other interpersonal relationship factors, as clustered and analysed under hypothesis ten, were also found to influence owner-manager's perception of network success. Indirect, if not direct support, can therefore be given to the specific findings of Morgan and Hunt (1994) as outlined above. Morgan and Hunt found that trust was more likely to exist if others had not acted opportunistically in the past; research presented here suggests that networks are more likely to be categorised as successful where opportunistic behaviour is not evident. Similarly, where good communications existed between the parties, respondents were more likely to report that the network was a success. In contrast however, shared values were not found to be significantly related to perceptions' of network success (Morgan and Hunt (1994) found that where values were shared, trust was higher). In line with their findings on trust, and the theoretical contentions of Hakansson (1982), where coercive power displays were shown to be evident in networks, those networks were considered to have been less successful.

Results presented here also provide support for the conclusions drawn by Moore (1998), who found that conflict had a negative affect upon the success of logistics alliances. Respondents who indicated that conflict between members was rare were also likely to indicate that the network had been successful.

Langfield-Smith and Greenwood (1998) in their research into buyer-supplier relationships

for Toyota Australia, found that the relationship was more likely to survive where communication between the parties were good. Again, results presented here would appear to support this finding. Where network members communicated with one another on a regular basis, the network was more likely to be perceived as having been successful.

The work extended here has considered the importance of variables such as trust, commitment, communication and power, which have been extended by members of the IMP group, and others, at both the theoretical and primary research level as key factors in inter-business relationships. This study has focused upon the effect of these variables on owner-managers' perceptions of the success of their network activities, and as a result has been able to draw similar conclusions. The presence of trust and commitment (at least in some capacities) in particular, has been found to be vital to network success. Where trust and commitment is not evident in a network, it is generally considered to have been unsuccessful.

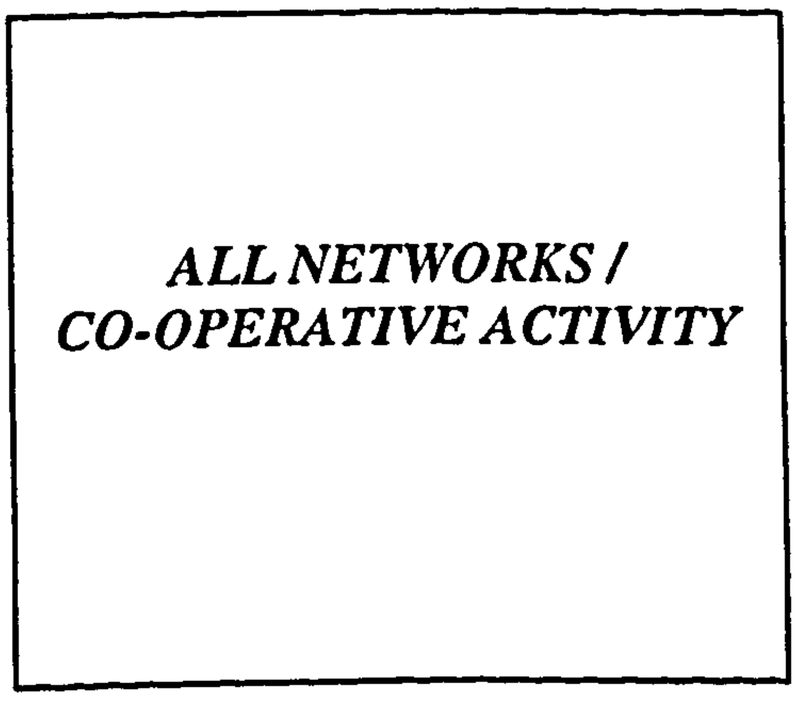
Preliminary conclusions drawn from this work would therefore appear to suggest that trust, commitment, etc are as important, if not more important in co-operative relations as they are in other business to business relationships such as supplier relationships (Gemunden, 1985; Langfield-Smith & Greenwood, 1998; Minahan, 1998; Smeltzer, 1997); R&D relationships (Hakansson, 1993); export relationships (Hallen, 1987); logistics alliances (Moore, 1998); marketing channels (Geyskens *et al*, 1998) and purchasing (Doucette, 1997).

9.2.12 Co-operation - A Hydra-conceptualisation

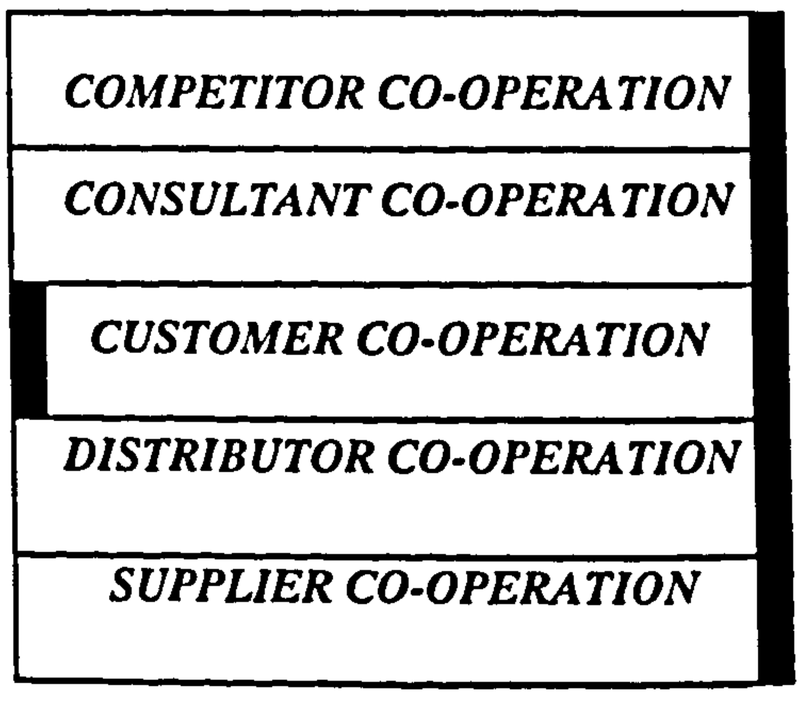
Traditionally theorists and practitioners have conceptualised co-operation as a 'black box' in which co-operative activity can be treated as a homogeneous mass which can be fostered and managed using a universally applicable strategy or approach. Conceptualisation in this way has acted to seriously thwart progress in both business co-operation research and its implementation in practice. As long as the accepted paradigm is one in which co-operative behaviour is seen as not varying with the type of party with whom actors are co-operating (e.g. competitors, suppliers, etc.) it will prove to be impossible to further the understanding of the affects of co-operative inputs on networks behaviour. Until now, research has been focused upon the study of co-operative inputs, few if any attempts have been made to unravel the contents of the 'black box', or determine whether a relationship exists between them and co-operative inputs such as owner-manager personality, membership of business related groups, etc.

Figure 9.1 – An Atomistic Model for Reconsidering Business Co-operation / Networking

Conventional 'Black box' Co-operation Model



Alternative Co-operation Model



The black areas found in the alternative co-operation model presented in figure 9.1 are used to represent individual networks, some of which maybe used by members to co-operate in all or a number of capacities (as represented by the black line on the right hand side of the model), whilst others may specialise in developing linkages for a single co-operative group (for example customers as represented by the black line on the left hand side of the model).

Research presented here suggests that co-operation should be considered at an atomistic level, that of the individual network. Although suggestions can be made (as they have been here) for optimising network performance, the co-operative dividend for both the actors involved and the local economy, it should be recognised that networks differ significantly from one another. The networks studied in the second phase of this research were low intensity – low formality groups or 'soft networks' as others have referred to them (Holmes, 1995), there is clearly scope for further research into other parts of the matrix (See figure 9.4). Such research though is likely to strengthen the argument for changing the existing co-operative paradigm in which all firm linkages are treated as though were the same, rather than assisting those looking to construct a single reductionist model which can be used as a panacea for treating co-operative ills and maximising network performance.

Evidence presented throughout this PhD would appear to suggest that the co-operative dividend for the local economy from supporting 'soft networking' activities is a poor one, with very few additional jobs being created as a result of such activity. Researchers and local and national support agencies should therefore look to 'harder' high intensity arrangements to see whether they are more capable of delivering such benefits.

9.2.13 Summary of Phase One Conclusions

Results derived from phase one of the research indicate that it is necessary to consider co-operation as a hydra-conceptualisation. To view co-operative activity as a homogeneous block is to drastically oversimplify and underrepresent the relationships at play. Whilst it is true to say that some network – co-operation based research can be applied *en masse* this is not the case for the vast majority. Results discussed within this document suggest that there is a need to consider co-operation on a typological and network basis, to do otherwise, would appear to be an act of voluntary rejection of the differences that clearly exist at these levels.

Findings summarised here have indicated that the effect of personality – attitudes, business group affiliation and the owner-manager's initial motivation for establishing or running his/her business impact on co-operative propensity in a number of ways. The effects of these factors would appear to vary significantly between the different types of co-operation. Antecedents shown to be significant for one type of co-operation, for example competitor co-operation, may be totally irrelevant to the understanding of others. The number of associations which appear to exist between attitudes held by owner-managers and their relative co-operative propensities would appear to suggest that a relationship does indeed exist between an individual's personality and their propensity to co-operate with others in a number of different ways. Logistic regression models advanced here suggest that a significant proportion of variations in co-operative behaviour can be attributed to attitudes held by the respondent. It is recognised however, that the models offered are at best only able to explain eighty percent of this variation; it would therefore appear that not all of the variables which have an impact on co-operative behaviour have yet been identified. The recent growth in the mathematics of chaos theory research throws question over the

explanatory viability of linear modelling techniques, at least in terms of their ability to provide all of the solutions The opinions of authorities operating within this area (for example Gleick, 1996 and Stewart, 1990) would suggest that it may be necessary to approach model which explains all of the variation may prove elusive. In the words of Stewart (1990: 3): *"It is an entire new world, a new kind of mathematics, a fundamental breakthrough in the understanding of irregularities in nature. We are witnessing its birth."*

9.2.14 Summary of Phase Two Conclusions

Similar attitudinal and behavioural heterogeneity to that described in the phase one conclusions is evident in conclusions extended for phase two. Once again, it suggested that it would be a mistake to consider all networks or co-operative activities as if they were the same. This argument is supported by Univariate results, which have indicated, as might be expected, that many differences exist between attitudes and behaviour displayed by different groups.

An awareness of these co-operative and network differences simply acts to underline the need for a flexible approach to the facilitation and management of these activities. It would therefore be wrong to attempt to superimpose an approach which has enjoyed success in one context into another, without at least some sympathetic adaptation of it, to address the contextual variations that are likely to exist. See for example the Danish Technology Institutes' approach, which was imported into the UK and used, at least initially as it stood. For a more thorough discussion of the implementation of the Danish Technology Institutes broker model in the UK, the reader is referred to Chaston (1995).

Results and conclusions derived from both phases of the research programme outlined here are pictorially represented in Figure 9.2. The first part of the model, labelled phase one, demonstrates the inter-relationships which exist between owner-manager's attitudes / personality, affiliation to business related groups, personal demographic characteristics and their firm's demographic characteristics, and their propensity to co-operative with others.

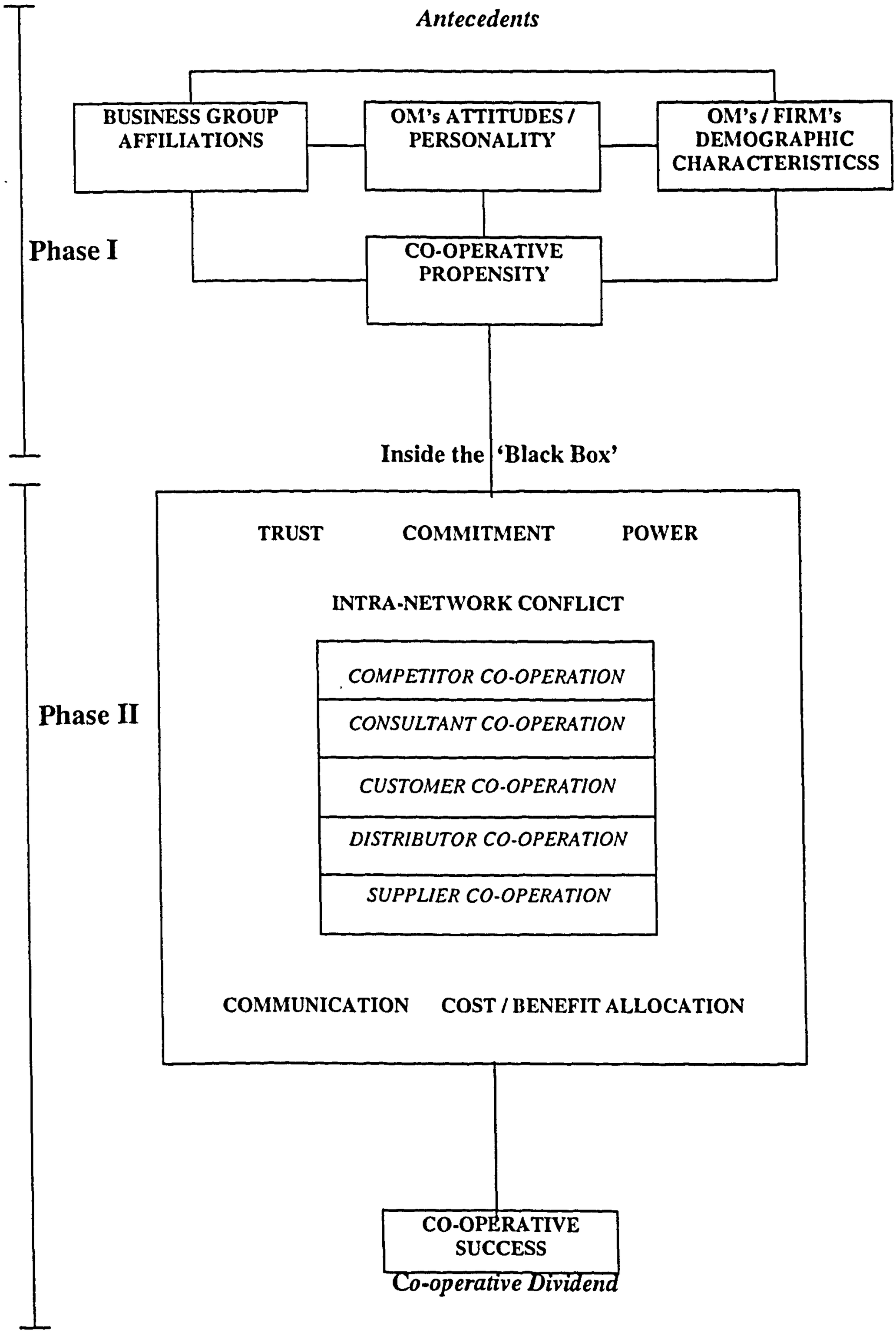
No direction arrows are included in the model, as it is not possible to ascertain conclusively, whether owner-manager's attitudes, etc are antecedents to co-operative propensity, or whether individual's propensity to co-operate is a determinant of their personality, etc. Clearly, the former case is the more likely, certainly in terms of owner-manager's demographic characteristics, where it is inconceivable that they would be determined by an actor's propensity to co-operate with others.

The box labelled 'co-operative propensity' in phase one of the model is an abbreviated representation of figure 9.1 offered earlier in this chapter. Although co-operative propensity is shown as an aggregate function, as has been argued at length elsewhere it clearly is not. Variables which correlate with one type of co-operation may be entirely insignificant when crosstabulated against another co-operative type. It should therefore be understood that it is only in the interest of clarity and pictorial simplicity that they are presented in aggregate form here.

The section of the model labelled phase two is used to summarise results and conclusions derived from phase two of the empirical research. This phase of the research sought to determine what factors may impact on the success of a network. An attempt has been made to further understanding of the factors at play within the networks studied. At the

centre of the model are the co-operative types studied identified and utilised through this research, placement in this way recognises the polymorphous nature of co-operation, and the need to avoid oversimplification of the relationships at play. It is important to note that the types of co-operation identified here are not extended as an all inclusive list, but are simply those that were identified through the qualitative research that front ended the quantitative research conducted. It is therefore entirely possible that future research will isolate other types of co-operation for which antecedents and correlating variables may be entirely different.

Figure 9.2 – Co-operative Interaction Model



Seven broad dimensions; trust, commitment, power, intra-network conflict, communication, cost allocation and benefit allocation were tested, and were found to be related to the co-operative success that a network enjoyed. Once again however, it is not possible to say conclusively, whether these factors are determinants of co-operative success, or whether the success of a network leads to their development.The following section takes the results and conclusions presented, and looks at their implications for both public sector network funding and network facilitation.

9.2.15 Implications for public policy co-operative – network funding and facilitation

Results presented here would appear to provide support for the contention that it is possible to categorise actors on attitudinal bases which can be used to assist in predicting their likely co-operative propensity (in a number of different types of co-operation) and behaviour. An awareness of owner-managers attitudinal heterogeneity, as exposed by this research, emphasises the need for a flexible approach to network support and facilitation, and the need for network brokers and leaders who possess good inter-personal skills which where necessary can be used to communicate, arbitrate and conciliate. These skills are particularly important where parties possess highly divergent views, objectives or strategies in relation to their co-operative activities.

The public sector therefore needs to acknowledge the need for highly skilled network brokers who can be viewed by the owner-managers they deal with, as possessing ample quantities of experience, competence and judgement. Training and remuneration should reflect the skill base required, as public sector support for co-operative activities will, of course, only be as effective as the people driving it.

9.2.15.1 Factors affecting network success - Guidelines for Network Brokers, Facilitators and Leaders

Although it was only possible to test for relationships between the network success variable and other variables included in the second standardised questionnaire at the Univariate level, a number of interesting results were nevertheless identified.

Not surprisingly, some networks are perceived as being more successful than others, some groups excelled at achieving the objectives set for them whilst others clearly did not. This once again reinforces the point that it is poor practice both on the part of researchers and practitioners, to view co-operative relationships and individual networks *en masse*. Networks and co-operative arrangement should therefore be considered at an individual level as the difficulties that they face and opportunities with which they are presented can vary substantially. It is therefore not possible to provide a single linear reductionist model which represents a panacea for those seeking to manage or foster arrangements, conclusions presented here should therefore be viewed only as suggestions, not as operational guarantees for co-operative success. No matter how many rules for success or best practice models are developed, there will always be contextual factors at play that will need to be evaluated by the network's broker, manager or leader. This caveat aside the following rules for increasing the likelihood of network success are volunteered.

- Networks in which members communicate with one another on a regular basis are more likely to be described as successful than those in which members contact one another less frequently.

- Networks in which individuals trust other members more than other business people they deal with are likely to benefit from greater success.

- Where larger network members contribute more resources to the group, the network is less likely to be successful than those in which they do not.

- A network is more likely to be successful when its members are in agreement at the outset as to what the objectives of the group should be.

- Where conflict between members is rare the network is more likely to be characterised as successful or unsuccessful, and less likely to be described as neither successful or unsuccessful. For some networks some conflict would appear to be beneficial, whereas for others it clearly is not.

- A network is more likely to be described by its members as having been successful when costs incurred through it are split fairly between all members.

- Networks are more likely to be perceived as successful where respondents view their fellow members as being honest and sincere.

- Where members are viewed as being friendly and approachable a respondent is more likely to indicate that a network has succeeded in achieving the objectives set for it.

- The most successful networks are those in which respondents do not indicate that they have greatest trust in those members with whom they have had the most contact in the past.

- A member is more likely to indicate that a network has been successful when the group rarely makes decisions that go against their wishes. Maintaining a good atmosphere and harmonious relationships would therefore appear to be a prerequisite to network success.

- Individual commitment is related to network success. Where commitment is high the network is more likely to be described as successful, and vice versa. Brokers and network managers should therefore ensure that new members are genuinely committed to the networks objectives, and that existing members remain so.

- Where no single individual uses their power to dominate the group, network success is more likely. Facilitators should therefore endeavour to minimise power asymmetries, so as to maximise co-operative benefits for the greatest proportion of members.

- A correlation exists between the amount of time for which an individual has been a member of a network, and the degree to which they believe it has been successful in achieving the objectives set for it. Individuals who have been affiliated to the group for less than two years are most likely to indicate that the network has been neither successful or unsuccessful, whereas those who have been affiliated to it for between two and three years are likely to indicate that it has been successful. Those individuals who have been members for more than three years are more likely to indicate that the network has not been successful. It would therefore appear that it takes time before the benefits of membership filter through to new members, perhaps because it takes a while to get to know other members, or because it takes time before the new member is prepared to network proactively. After three years it would appear that membership may be something of a habitual affair. Network facilitators should therefore seek to maintain commitment over time, and state that in some cases it may take a while before the true benefits of

membership begin to filter through. As a result of which it may be possible to increase network effectiveness by seeking to minimise the negative affect that length of time has on individual's perception of the networks success.

- Where membership of the group leads to a quantifiable increase in profitability, sales volume or market share the network is more likely to be perceived as a success.

- Similarly where an increase in turnover can be attributed to the group, its members are more likely to rate it as having succeeded in achieving the objectives set for it.

- The location of the member's business may also prove to be a determinant of their perception of the network's success. However, the large number of counties from which members were drawn in this research, relative to the absolute number of respondents who participated in the survey, precludes the drawing of concrete conclusions about such a relationship. Further research into this potential relationship between business location and perception of network success could be conducted through use of a single large network. By using such a sample it will be possible to determine whether a proximity relationship exists, and whether members who are located furthest away from the network's head quarters or meeting place are less likely to perceive the group as having been unsuccessful than those that are positioned closer to it.

9.3 Research Limitations and Caveats

9.3.1 Potential Sample Frame Bias

As is generally the case with empirical research, the sample often represents a source of bias, and the research discussed here is no exception. In addition to what might be regarded as normal sample error, this research has two other sources of such bias.

Individuals responding to the first standardised postal questionnaire which was administered as part of phase one were selected at random, but the directories and sample frames from which they were drawn were not. Two populations were used to select individuals for inclusion in the first phase of research, the Dun and Bradstreet Westcountry Business Directory and the BEMA membership list. Although it was recognised that the Dun and Bradstreet Directory was unlikely to represent a census, or indeed be as comprehensive as local government constructed business directories could be expected to be, it afforded one significant advantage over other local directories. Local government directories are constructed on a voluntary basis, with owners / managers being sent a letter and flyer inviting them to submit their company's name and details for inclusion. The fact that these directories are voluntary, and that individuals often have had to pay for inclusion, may have represented a potential source of personality / attitudinal homogeneity. The most important hypothesised example of this was that individuals who volunteered their details in this way would possess a higher propensity to co-operate than those who did not.

The Dun and Bradstreet directory was therefore selected, as inclusion in it is made on an involuntary basis. Individual – firm details are included when a credit search has been

requested of Dun and Bradstreet for that firm. Clearly, this sample frame itself is not without bias, it stands to reason that only those firms on which a credit check had been conducted could be included. The sample appears to be underrepresented by micro-firms, which it could be argued were less likely to be competing successfully for contracts with larger firms who are able to afford the luxury of requesting such checks. The argument then is not that the Dun and Bradstreet Directory is itself completely free of bias, but rather that it was believed to be the best available alternative to the directories most frequently used in organisation research.

The second phase of research, which analysed inter-firm relationships at the network-business club level also contained a potential source of bias. Business club – network leaders and co-ordinators were approached, and asked if they would mind if a questionnaire was administered to their members. Research participation was thus voluntary as the group co-ordinator is playing a gatekeeper role, such individuals are therefore unlikely to give permission for the research instrument to be administered if they are not already fairly confident that the research outcome will be favourable, and will not therefore have an adverse affect on their own position within the network or group. Research reported is therefore potentially skewed towards successful networks. Possible solutions to this methodological dilemma are volunteered in the further research section outlined later in this chapter.

9.3.2 Sample size

It may be argued that results presented here are derived from small samples. Given the choice a researcher will almost always favour a large sample over a small one. Although the samples upon which phase one and phase two results are based are in fact quite large

for the business research field (307 respondents and 257 respondents respectively) because the sample has been split on several occasions (e.g. only respondents who had co-operated with others completed section B of the first questionnaire), the absolute number of responses for some of the questions is considerably lower.

Given time and financial constraints however it was not possible to administer either of the research instruments to a larger sample. As with all research hypotheses those substantiated or refuted here will benefit from follow up studies which test their robustness in identical, similar or divergent conditions. As indicative tools for furthering the understanding of network / co-operative behaviour their value should not however be underestimated. An awareness of the possibility of a relationship existing between two specific variables therefore represents a substantial improvement to the empirically impoverished literature base.

9.3.3 Result generalisability

Results derived from this research programme are clearly not representative of inter-firm relationship activity for the whole of the United Kingdom. The first questionnaire has a clear bias towards the south-west, with respondents most frequently being located in Avon, Cornwall and Devon. The second questionnaire is also geographically biased, with almost all of the members of all of the networks being based in the south. There is then a need to conduct further research in which a larger sample is used, and which is more representative of the UK's business population.

9.3.4 Single piece of research

As has already been alluded to above, results presented here are a summary of a single investigation into antecedents to co-operative behaviour, it is only through further empirical study of this complex field that its complexity will be unravelled. There is then, a need both to repeat this study using the same research instrument, and using alternative approaches which also focus upon the determinants of individuals' co-operative propensity, and the success which they enjoy at both the individual (ego co-operation) and the network level.

9.3.5 Defining co-operation

The qualitative research conducted prior to the administration of the phase one questionnaire indicated the dangers inherent in a research approach in which co-operation or networking was narrowly defined, consequently the research discussed in this document has been based upon a broad definition of co-operation. It is clear though, that a research programme which utilises a narrower definition of co-operation or networking, and which is able to prevent the obvious encoding-decoding difficulties will potentially be more profitable it terms of the research returns in provides.

9.3.6 Use of a ten percent significance level

Although the use of a ten percent significance level for Univariate and multivariate analysis might be considered as unjustifiable by researchers from some disciplines, its use is appropriate here, due to the dearth of empirically based research in the networking - co-operation field. Research is presented here, as both a methodological and empirical

breakthrough. Researchers previously active in the field have for the most part shied away from empirical work, and where it has been conducted, have attempted little more than counting exercises based on results which are presented as being generalisible, but are in truth only valid as measures of activity for the samples from which they were drawn. Research presented here has sought to address this issue, and as a result has used a comparatively high significance level so as identify a number of "potential relationships" which can be examined and validated at a later date by the author and other researchers.

9.3.7 Number of cells with a frequency of less than five

Results derived from chi-square contingency tables, and summarised throughout this document, indicate that on a number of occasions the percentage of cells with a frequency of less than five exceeds the conventional twenty percent level, as a result there is a need to treat the findings with some caution. It is only through further research that it will be possible to determine whether results believed to be significant here are actually so, or whether they are the product of a statistical anomaly. By administering the same research instrument on a larger sample, it will be possible to ascertain whether the relationships noted here are in fact so strong that the number of cells with a frequency of less than five is in fact high, simply because of the strength of the relationship.

9.3.8 Caveats and limitations summary

It has been argued that research presented here could benefit from improvement or development in a number of ways. Although it is recognised that the research outlined is effectively breaking new ground, it is still acknowledged that there are a number of ways in which future research could be refined. The potential for bias within the sample frames

used, the size of the sample itself, result generalisability, the mileage that might be derived from a narrower definition of networking – co-operation, the use of a ten percent significance level and the number of cells with a frequency of less than five have all been discussed. The section which follows offers implicit and explicit advice on ways in which these gaps and others might be addressed.

9.4 Further Research

In addition to the very specific recommendations for further research which are extended as a means of 'filling the gaps' in the research reported here, there are a number of more general areas that merit consideration as sources for further research. The following four sections draw attention to: the need to take a broader view of individuals' and firms' network activities; the need to consider alternatives to the owner-manager's personality as determinants of co-operative propensity and behaviour; the need for further primary research into the importance of trust, commitment and other variables identified by the IMP group and Morgan and Hunt (1994), and finally, whilst considered at a more specific level later in this chapter, the need for primary research which utilises a alternative(s) research philosophy.

9.4.1 The Need to Consider Alternative Networks

As has been identified in the literature review discussed earlier in this document, the terms 'network' and 'networking' have been applied indiscriminately to describe a multitude of different activities. The research reported here has focused upon business networks, on the

grounds that it is these relationships which are likely to have the greatest impact upon a firm's performance. However, research into the impact of other types of networks, particularly individuals social networks, is also likely to produce dividends for those who study them. For example, by studying both social and industrial - transactional networks it may prove to be possible to determine whether individuals who are highly active social networkers, are more likely to participate in, or 'champion' industrial networking.

In addition to the above, no attempt has been made here to differentiate between voluntary and compulsory networks. Whilst broadly speaking it could be argued that co-operative activities investigated here could be categorised as voluntary, such a blanket statement cannot be justified. For example, in the case of vertical networks, respondents may have had no choice (if they were to survive) but to 'co-operate' with their suppliers (sole supplier situation) or distributors (due to their market coverage). Hence by investigating and comparing voluntary and compulsory co-operative activity it may be possible to answer such questions as: Are trust and commitment of equal importance in voluntary and compulsory networks? Do antecedents to compulsory co-operative activities differ from their voluntary counterparts?

9.4.2 Alternatives to the Owner-manager Personality Antecedent

One of the principal antecedents to SMEs co-operative propensity and success which has been considered by this study is the owner-manager's personality. Whilst some non-personality factors were included in this research programme (such as the respondent's principal motivation for starting or running the business; their membership of business related groups - for example the freemasons; type of business; age of business; age of

respondent; business location; sex of the respondent; perceived growth phase for the firm) as potential antecedents to co-operative propensity, others may exist which have not been considered here. The variables considered here are not presented as a definitive list, and it is entirely conceivable that research into co-operative propensity and success antecedents which adopts a non-personality focus will prove equally rewarding.

Additionally, the personality based approach which has been utilised by the researcher could be adopted and used on different subjects within the firm. The personalities of other individuals within the organisation could also affect co-operative propensity, form and success. Whilst justification for focusing upon the firm's owner-manager has been extended elsewhere, it is conceivable that there are other individuals within the organisation who have an important, if a more important impact upon co-operative activities. Other members of the senior management team may have a greater strategic impact upon the firms than the owner-manager. For example, the manufacturing director of an organisational may be the most influential member of staff when the firm is trying to tie up with another organisational to jointly produce one of the firm's products. In the case of improving customer relations the sales or marketing director may prove to be the most useful individual to study. In addition to the impact of senior staff on strategic co-operative decision making, there is also a need to consider the role of those that operationalise inter-organisational strategies on a day to day basis. If the key operators in a co-operative relationship between two firms are their respective engineering teams, trust and commitment as engendered and perceived between these two groups of employees may prove to be far more significant than that offered and perceived by the companies' owner-managers.

9.4.3 Trust, Commitment and the Case for Further Primary Research

Whilst it has been demonstrated (in line with arguments extended by researchers active in both the IMP (Ford, 1990)) and the general networking literature (Morgan & Hunt, 1994), that trust, commitment, relationship power, etc. are important in inter-firm relationships, there is a need to develop further this area of research. For it is only through further research that theories can be evolved or results refuted. Results presented from this study suggest that the affect of trust and commitment on network success is a complex one, whilst support was found for a relationship between some trust and commitment variables for others it was not. This research programme by focusing on a specific type of inter-firm relationship, co-operative activities, has demonstrated that trust and commitment are important. However, importance of these variables is likely to vary along with the party being co-operated with. For example, trust and commitment may be less important in supply chain linkages than they are in co-operative links with competitors. There is therefore a need to consider the importance of trust and commitment at the co-operative party level, rather than rely on the results of aggregated data presented through this study.

Additionally, alternative research methods should be utilised which should provide researchers with a greater insight into why trust and commitment are so important, and how they affect relationships. If researchers rely principally upon positivist research methods, only so much of the trust - commitment - co-operation picture will be revealed. A positivist approach, particularly if it is heavily reliant upon quantitative research methods, as has been the case with this research programme, is inherently biased. By adopting such a research philosophy the researcher blinds him/herself to the possibility that factors that have not been considered may be relevant to the investigation.

Extensive use of qualitative research techniques is therefore likely to reveal other variables which affect network trust, commitment and success. Given that trust of another, for example, is a highly personal and internalised emotion, it is likely that investigation into it would be more fruitful if more than the 'snapshot view' volunteered here were constructed. By employing a qualitative approach (whether it employs depth interview or ethnographic research methods) may enable its users to determine why participants trust one another or commit to their co-operative activities.

Alternatively, if a quantitative approach is favoured, longitudinal studies should be considered. By investigating co-operative relationships on an on-going basis it will be possible to determine the extent to which actor trust, commitment, etc. changes (if at all) over the life of a co-operative relationship.

9.4.4 The Role and Need for Non-Positivist Research Methods

As has been identified at some length in the methodology section of this document, the research philosophy adopted for the research presented is one of cognitive behaviourist - scientific realism. By adopting such an approach, and the research methods which it implies, the outcomes of this research have effectively been biased. Such an approach enables the collection of quantitative data which enables the researcher to make statements about what is happening, but not why it is happening. Information can be collected on what variables are important, and how they may affect other variables, but not why they affect those variables, or indeed whether they are the only variables upon which data should have been collected.

Whilst the use of qualitative research methods as a means of providing explanations for co-operative propensity and behaviour which is reported here is obvious, there is clearly also a need to make use of such methods as 'theory builders' in their own right. Extensive use of such methods is likely to identify issues and variables which a largely quantitative approach could never identify. Whilst the ethnographic example cited later in this chapter is perhaps a more extreme example, much could be learnt from extensive use of depth interview and focus group techniques. Answers to questions such as: who are the key strategic co-operative decision makers? who is responsible for day to day management of co-operative relationships, and how, why and if those relationships are important to the firm are unlikely to be forthcoming through the utilisation of quantitative research methods.

The above are examples of how qualitative techniques might be employed, and the prescriptive way in which they have been presented, again precludes the identification and observation of the unexpected, which may prove to be equally important information. A grounded theory approach as advocated by Glaser and Strauss (1967) may therefore prove to be the most fruitful avenue to pursue.

9.4.5 A National Sample

Attention has been drawn to the need to administer the existing research instrument to a larger and more nationally representative sample. By drawing on a larger sample with greater geographical coverage, it may be possible to determine whether real differences in co-operative propensity and success exist on a national and or regional level. This research programme has already demonstrated that it is wrong to approach all types of co-operation

and all networks as though they were the same, but it is equally likely (and there is some evidence to support this contention from the results presented here) that behavioural differences exist on a geographical as well as typological basis.

Research on a national level will not only identify geographical differences in co-operative propensity and success where they exist, it will also act to validate or dismiss results presented here. Validation in this way is an essential step, it is only through such studies that it will be possible to view results presented and conclusions drawn here as being reliable.

9.4.6 Constructing a co-operation or network success logistic regression model

National and international studies which employ the same research instruments as those used here can clearly be used to support or refute both the univariate and multivariate relationships and models identified. In addition to the above they can potentially fill a significant gap in the empirical research summarised here. Although several attempts were made at modelling the data using logistic regression, on both occasions it was not possible to construct a useful model. For the first phase in which factors were tested for their effects on co-operative success it was not possible to produce a model within twenty iterations. For the second phase in which network success was the central focus, it was once again not possible to produce a multivariate model. The inclusion of the necessary category of "Do not know" on the second questionnaire meant that if data was to be cross-tabulated so as to produce the lowest possible number of cells within the table, thereby increasing the number of cells with a frequency of greater than five, it was necessary to recode these responses as missing values. This meant that when the data was run using logistic regression analysis, there were not enough cases with which to construct a model.

There is therefore still a need for a multivariate model, which can be used as an explanatory tool for furthering the understanding of antecedents to network success. A number of univariate relationships have been identified through this research programme, and it is quite conceivable that construction of such a model will be a relatively easy matter if the same research instrument is employed with a bigger sample.

9.4.7 Changing the Intensity-Formality focus

Research presented here has focused, at least for the most part, on low intensity low formality relationships such as business club membership, and the factors which drive individuals to join these groups and the factors which affect their success. As is clear from the Intensity-formality matrix presented in Figure 9.4, and originally outlined in Chapter Two, there are a number of other business relationships which merit investigation.

Figure 9.3 - Network Intensity - Formality Matrix

	Formal	Informal
High Intensity	* Strategic Alliance * Contracted transactional relationship	* Adhoc research * Information Sharing * Shared R&D
Low Intensity	* Sleeping Partner	* Trade Associations * Business clubs

Although it is fair to say that some validation work will need to be done before any concrete conclusions can be drawn with regard to low-intensity low-formality relationships investigated as part of this research programme, there is also clearly a need to investigate some of the other types of inter-firm relationship. Researchers considering this route will though need to be aware of the methodological difficulties they may face, Mason and Harrison (1995) in their empirical study of sleeping partner relationships had great difficulty in eliciting an adequate response rate from their sample, results derived were in the end based on a useable response rate of less than seven percent. Similar difficulties are likely to be encountered in the high intensity relationships, where inter-firm relationships may represent a significant source of competitive advantage, and as a result sampled individuals may be reluctant to respond even when anonymity is assured.

9.4.8 The need for a reliable business relevant personality instrument

The relative failure of the Durham Business School Personality Instrument, at least as a tool for classifying respondents on the basis of meaningful personality dimensions, and the review of the mainstream personality literature acts to demonstrate the chasm which exists between mainstream personality research, and its use, or rather abuse, in business research.

Business personality research has not succeeded in keeping pace with mainstream personality psychology research which has, for the most part, seen a consensus of opinion towards the interactionist five trait approach, known as the "big five". The obvious opposition to the use of mainstream psychological tools in business research is one of

salience. Unless the respondent can see some relevance in what they are being asked to do, or, they are interested in it, the response rate is likely to suffer.

Operating on their own, business personality researchers have failed to develop a reliable personality instrument which can be used to identify personality traits, and which goes some way towards explaining variations in individual behaviour. There is a need for business personality research to return to its old roots, and for a test based perhaps on the "big five", to be constructed from first principles. Until such a test is developed, it will only be possible to speculate about business people's personalities and their behaviour. Once an adequate test has been developed, it will be possible to effectively model causal relationships between owner-manager personalities and their co-operative propensity and behaviour. Until then, researchers will have to settle for the identification of relationships between owner-managers' attitudes, which although largely congruent with personality, cannot at this point be guaranteed to be the same.

9.4.9 Alternative methodological approaches

As has already been made clear in part above (section 9.4.4) the largely quantitative approach which has been employed in this research programme is but one way in which co-operative behaviour can be investigated. Others clearly exist, the use of qualitative techniques, in particular, is likely to prove rewarding.

9.4.9.1 Longitudinal approaches

Research presented here has effectively offered a snapshot view of co-operative propensity and success. There are, of course, dangers in drawing conclusions based upon such

findings. The snapshot approach does not consider the effects of time on individual's co-operative or network behaviour. Given that individual's personality is widely believed to a function of traits with which they are born and the environment in which they operate, the attitudes they hold are likely to alter (albeit minimally over time). It is only through studying co-operative behaviour on a longitudinal basis that the effect of these contextual factors will be able to be measured reliably.

9.4.9.2 Investigating networks former members

As has already been discussed at some length (in the caveats and limitations section of this chapter), research presented here is likely to be skewed towards successful networks. The networks studied were low intensity – low formality groups, in which network commitment and exit costs are low if not non-existent. Dissatisfied members are therefore able to demonstrate their displeasure by leaving the network. It is likely then that at any given time a network will be predominantly composed of individuals who view it as having been relatively successful in its capacity to achieve the objectives set for it.

There is therefore a need (if conclusions about the true antecedents to co-operative success are to be drawn) to sample individuals who have left networks, so as to find out the reasons for which they left, thereby determining whether these individuals differ significantly in terms of the personality / attitudinal or demographic characteristics that they possess.

9.4.9.3 An ethnographic approach

The merits of alternative research methodologies and methods have been outlined at the

general level in section 9.4.4 above, a more specific application of ethnographic methods would be a study of the role and importance of the group's leader or co-ordinator. As has been identified elsewhere, such individuals are likely to have a significant affect upon the relative success or failure of a network - co-operative group, and also represent a significant source of sample bias for researchers employing quantitative research methods. In their capacity as gatekeeper to their groups they are able to prevent researchers from investigating networks that they believed to be less than successful. There is a need therefore to consider alternative methodologies to the largely quantitative techniques, which have been outlined and employed as part of this research programme. An ethnographic approach would seem to be a logical one. By adopting the role of an organisational anthropologist by joining a network or a number of networks, the researcher(s) may be able to determine a group's success from the inside. Clearly involvement in this way may result in a partial loss of objectivity, but as long as users of the results are aware of the potential for bias, this is likely to be outweighed by the unique insight that such an approach will provide.

Alternatively researchers might consider establishing their own business network; by operating in a co-ordinator or leader capacity, it will once again be possible to elicit a level of insight that is rarely possible in business research.

9.4.10 The Role of / for the Network Broker

As has been alluded to in the section on ethnographic research outlined above, the role of the network facilitator is a vital one, and the skills and ability of such an individual may be a crucial determinant of network success. More specifically however, there is a need to consider the role of the network broker to ascertain how much these individuals bring to co-operative process. Doubt has been placed over their role by some of the results presented here, for example, many respondents indicating that they did not and would not co-operate with strangers. Does the involvement of a broker overcome this co-operative barrier, and if not does the broker add any additional value to the co-operative process? These and other questions clearly need to be answered, with pressure being brought to bear on the business support budget all the time, and with the Department of Trade and Industry currently investing million of pounds in co-operative support through the employment of brokers such research should be pursued as a matter of urgency.

9.4.11 Non-hypothesis related results - areas for future research?

9.4.11.1 Co-operation - Legal - Non-legal - Formal - Non-formal Classification

Results reported relating to the legal nature of co-operative relations is roughly congruent with those offered by Johannisson (1986), that is to say most firms are engaged in non-legal or in Johannisson's terms informal relationships. The legal – non-legal construct was used in this research as it was felt that it was less ambiguous, and therefore less open to misinterpretation through encoding - decoding difficulties. However, given that similar results have been recorded for both the formality (the terminology employed by Johannisson) and legality classification methods it seems reasonable to conclude that the

two may well be interchangeable. No concrete conclusions can though be drawn until the research instrument utilised here is administered in the country in which Johannisson drew his sample. Until such a time, the results presented here and those recorded by Johannisson should be viewed independently, and as though they are a possible result of the varying attitudes and behaviour, which may well exist between the two cultures. Clearly however, such a finding lends significant anecdotal support to the intuitive assumption that the two terms may be used inter-changeably, and as a result provide a creditable hypothesis which can be used for those seeking to further our understanding of this complex area.

9.4.11.2 Amount of time for which the co-operative partner has been known

Results outlined in phase one of this research would appear to indicate that co-operation between strangers is rare, over eighty five percent of respondents who co-operated with others indicated that they had known the other party for a year or more, with over fifty five percent indicating that they had known the other party for at least two years before co-operating with them. This finding supported by further research has clear implications for network researchers and support practitioners alike. If follow up studies, which draw on a larger and more geographically diverse samples support this result, it will be necessary to revisit the role of the network broker or facilitator. If such individuals are not succeeding in increasing individuals' propensity to co-operate with strangers, are they in fact adding any value to the co-operative process? If their role is simply one of encouraging individuals to co-operate with other individuals that they already know, is it possible to categorically state that any additional benefit is being derived from their involvement? Is it not possible that these individuals may well have co-operated without the external involvement of a network broker? If Granovetter's argument (1973) that the most benefit can be derived from weak ties (i.e. those with strangers) where the skill base is likely to be

more heterogeneous is accepted, what support or indeed non-support measures are required to encourage individuals to foster relationships of this type?

9.4.11.3 Sources of concern when co-operating with others

The areas which were the source of greatest concern for respondents were that those with whom they were co-operating would not deliver the required standard (approximately forty percent of respondents indicated that this was a source of either strong or reasonable concern) or that the benefits they expected to be derived from the arrangement would not be realised (nearly thirty percent of respondents indicated that this was a source of either strong or reasonable concern). On the whole respondents did not cite the possibility of co-operative partners breaking the agreement or not treating it as confidential as being a problem, only 22.35% and 20.69% of respondents indicated that these areas were sources of either strong or reasonable concern. An even smaller proportions of respondents indicated concern (whether strong or reasonable) that co-operation might weaken their competitive position (14.71%) or result in loss of control of their firm to a third party (11.90%).

These findings have clear implications for all parties involved in the initiation, facilitation or management of business networks or co-operative activities, by identifying the principal sources of concern in this way this research will assist such individuals when they are appealing to potential new members or co-operative partners. As a rule, appeals which emphasise the mechanisms built in to protect members from a loss of control over their firm, or a weakening of their competitive position are likely to be less successful than those which draw attention to control measures which are utilised to ensure that co-operative parties deliver to the agreed specification, and in a manner which ensures that all parties'

anticipated benefits are realised.

Once again however, it is only through further research which adopts co-operative concerns as its principal focus, that it will be possible to draw concrete conclusions in this regard.

9.4.11.4 Long Term, Medium Term or Short Term Motivation?

The largest proportion of respondents (39.11%) indicated that their co-operative relations were driven by short term needs, results presented though suggest that short term motivation was not the best ingredient for co-operative success. Respondents driven by short (1 to 3 years) or medium term (3 to 5 years) needs were less likely to enjoy co-operative success than their counterparts who were motivated by long term (over 5 years) requirements. Network brokers, facilitators and leaders can utilise this finding to optimise co-operative success. By recruiting individuals who are driven principally by long or even medium term needs it should be possible to maximise co-operative / network benefits for both the individuals involved and the local community alike. Results presented here would therefore appear to indicate that the initial motivation of an individual impacts on the level of success they can expect to derive from their general co-operative. As with the other results presented in this section though, it is only through further research into actor motivation and co-operative success that concrete conclusions will be forthcoming.

9.4.11.5 Benefits sought by co-operatees

The most heavily cited benefits derived from co-operative activity were those which might be viewed as the positive ones, for example increased profit or firm growth (73.0% and 64.56% of respondents respectively). A significant proportion (29.11%) indicated that they

benefited from reduced uncertainty, though. Five percent of all respondents indicated that had no choice but to co-operate with others.

These findings once again have clear implications for those looking to support the co-operative process. A perusal of these results indicates that the benefits sought by co-operating owner-managers are heterogeneous, it is therefore foolhardy to assume that all participants or potential participants are driven by the same needs. Some individuals, such as those who indicated that they had no choice are co-operating on an involuntary basis, if presented with a choice many would probably opt to go it alone. By acknowledging the fact that the benefits sought by co-operative partners are not always the same, it will be possible for support bodies and individuals to optimise the co-operative performance of the groups or networks they manage. It may be that groups comprised of like-minded individuals (that is to say those that co-operate to realise similar benefits) perform better than those in which benefits sought are more heterogeneous, equally however the opposite may prove to be the case, and it is only through further research focused on this area that firm conclusions either way will be possible.

9.4.11.6 The Role for support agencies in facilitating inter-firm co-operation

When asked explicitly about the role of support agencies in the co-operative process, reaction was mixed. For all categories however, the number of respondents indicating that third party involvement in this way would be a "strong" or "reasonable" benefit was less than thirty percent. This finding suggests that the involvement of public sector employees in the co-operative process may be seriously misguided. Existing co-operative activity support would therefore appear to be sub-optimal, the role for public sector agency involvement in this area is therefore open to question. It is possible that funds currently

being employed in this way might be better employed in the form of grants for owner-managers or business clubs prepared to facilitate co-operation in their local economy. Alternatively, it may be possible to develop and employ a method for identifying individuals who are likely to be more amenable to third party involvement in their co-operative activities. It will of course also be necessary to determine whether the co-operative dividend derived from utilising public sector employees (in any capacity) outweighs the significant costs of their employment. A signification investigation into this area represents a substantial undertaking in itself, and one which other researchers and national governments in particular may find particularly rewarding.

9.4.11.7 Network composition and preferred gender of co-operative partners

A significant relationship was noted between the gender with which an individual preferred to co-operate, and the actual composition of their personal networks. This finding suggests that attitudes held by respondents may indeed be a good indicator of future behaviour. A relationship was also identified between the respondent's sex and the gender composition of their personal network. Male respondents were more likely to co-operate with other males and female respondents with other females. If supported by further research this result has substantial implications for network facilitators, such individuals must be aware of the fact that some individuals may not respond well to suggestions that they co-operate with the opposite sex, and if they do, the co-operative dividend produced may prove to be rather less than that anticipated.

2.4.12 International Comparative Studies

Once the research instrument has been shown to be reliable through studies at the national level, it can be used to compare co-operative activity and behaviour at the international level. The theoretical research of Fukuyma (1996), and the empirical work of actors such as Hofstede (1988) would appear to suggest that general business behaviour is affected by an individual's national culture and value set. The existence of these cultural differences, and the varying levels of institutional support that co-operation receives on a global basis, would suggest that individual's co-operative propensity and success is likely to differ significantly between countries.

The dominance of Scandinavian academics in the networking literature raises a number of questions, such as whether there are cultural variables that make networking in these countries a more probable solution to resource deficiencies. It may be that Scandinavian academics are simply more interested in networking than their counterparts from other countries or that there are environmental conditions not common to all nations which precipitate or facilitate co-operative activity within these countries.

The three factor clusters of Attitudes, Culture and Environment are clearly interdependent, and thus should not be considered in isolation. Attitude formation and possession has been discussed and explored at some length throughout this document; further analysis of the local culture and context (environment) is therefore required. The literature offers the following environmental factors which might be taken as explanations for the prevalence of Scandinavian network activity and success. Johannisson (1986) argues that co-operation represents an invaluable means of shortcutting the bureaucracy inherent in a negotiated economy, and in Denmark network formation has been heavily assisted by the provision of

large grants for those who participate in them. Despite the presence of these environmental differences, it is unlikely that they alone can be used to explain the co-operative differentials which would appear to exist between the Scandanavian countries and other parts of the world.

Cultural differences are also likely to be responsible for much of this variation. This view is supported by the empirical work of Hofstede (1988) in his principal work *Cultures Consequences - International Differences in Work-Related Values.* One hundred and seventeen thousand questionnaires were completed by 60,000 respondents in 66 countries within what he referred to as the *Hermes Corporation*, but which is now known to be IBM.

Methodological conformity was ensured, by using replies from employees operating in the same functions, sales and service. Within the sales and service function all types of employees were surveyed, including, salesmen, clerks, professional engineers and top managers, each was surveyed in their own language and as a result, a total of 20 different language versions of the questionnaire were used.

Respondents thus represented well matched sub-sets - same company, same job, similar education, but different nationalities, the only variable not therefore being controlled for was nationality. The survey was repeated after four years with stable results, thus confirming the cultural nature of the differences found.

Hofstede (1988) identified four basic areas of difference between national cultures. Each nationality was positioned from high to low on each of the four scales. Each nationality therefore has a distinctive cultural profile. The four areas identified were power-distance; uncertainty-avoidance; individualism and masculinity.

The power-distance index was described as the extent to which the culture encourages superiors to exert power. The uncertainty-avoidance index highlights the ease with which different cultures cope with uncertainty, instability and change. The individualism index is a measure of the level to which a culture can be said to encourage individual as opposed to group centred activities. The final index masculinity is a measure of the extent to which a culture can be described as masculine or feminine. Masculine cultures were driven by ambition, money and material possessions. Feminine cultures in contrast were held to emphasise quality of life and people centrality.

By utilising cluster analysis Hofstede was able to reduce the original forty cultures to eight country clusters: *More Developed Latin; Less Developed Latin; More Developed Asian; Less Developed Asian; Near Eastern; Germanic; Anglo and Nordic.* To these groups he was able to apply a number of characteristics.

The principle clusters he found in Europe were Anglo, Germanic, More Developed Latin and Nordic. These groups have been tabulated below in terms of the four dimensions previously identified.

Table 9.3 - European Culture Cluster Comparison

Anglo (e.g. Great Britain & USA)	Germanic (e.g. Germany & Austria)
Low Power-distance Low Uncertainty avoidance High Individualism High Masculinity	Low Power-distance Medium-High Uncertainty avoidance Medium Individualism Medium-High Masculinity
More Developed Latin (e.g. France & Spain)	**Nordic (e.g. Sweden & Denmark)**
High Power-distance High Uncertainty avoidance Medium-High Individualism Medium Masculinity	Medium Power-distance Low-Medium Uncertainty avoidance Medium-High Individualism Low Masculinity

Adapted from: Hofstede (1988)

From the above information alone it is possible to hypothesise a need for significant adaptation of any networking model, so as to accommodate national differences in culture.

Hofstede's evidence would suggest that culture has:

"profound consequences for the validity of the transfer of theories and working methods from one country to another". (Hofstede, 1988: 12)

He demonstrates this point by drawing on McClelland's (1961; 1965; 1975) work on motivation, and in particular the need for achievement.

"McClelland's achievement motive stands for the value pattern of the masculine risk taker, which corresponds with the U.S. pattern; (...) The combination of high individualism, low uncertainty avoidance, and masculinity in the United States also explains the popularity of Maslow's Hierarchy of Human Needs. Maslow's supreme category, self actualization, is a highly individualistic motive". (Hofstede, 1988: 255-256).

Prima facie evidence such as that offered by Hofstede draws attention to the dangers of applying any theory *carte blanche* for all nationalities and cultures. His work is not however not without its limitations:

(i) It reflects the sentiments of employees from only one firm - IBM, a company that is said to have a culture all of its own, and one which is thought to be capable of transcending national borders. If IBM's company culture really is that strong, results produced by Hofstede are likely to be a diluted representation of the differences which exist between countries.

(ii) It is only directly applicable to inter-firm activities, not intra-firm activities such as networking. Although it is likely that similar differences exist at the inter-firm level there are no guarantees that this is the case. It is only through further empirical research which utilises the same research instruments that real conclusions in relation to inter-firm co-operative behaviour can be realistically made.

Despite its limitations Hofstede's work does illustrate the possible differences in value sets of individuals who have received the same education, work in the same company, and do the same job. A similar study was conducted by White (1990), although a different multi-national corporation and a smaller sample was used, the same research instrument was employed. Results presented and conclusions drawn were congruent with those of Hofstede and his colleagues.

Additional work by Mallory *et al* (1983) and Barzini (1987) supports the existence of international variations in business practice and conduct. Again this is only useful in its application in intra-firm decision making, strategy formation and implementation. In the

inter-firm context cultural differences as a potential hazard to trading and theory application remain largely untested.

This said, some networking research does exist at the international level, and although this is essentially a simple arithmetic comparison of hours spend making, maintaining and utilising contacts (Birley, Cromie & Myers, 1991), its results do support the hypothesis of varying networking practices at the international level. Irish entrepreneurs for example were found to spend less time developing new non-customer relationships than their Italian and American counterparts. Reasoning was also offered for the popularity of networking in Scandinavia:

> *"Because the Swedes actively encourage community networking and, because Swedish business founders have a propensity to network, it seems likely that autonomous entrepreneurs in Sweden might be predisposed to networking principles."* (Birley, Cromie & Myers, 1991: 60)

Cultural influences on networking clearly need to be examined, evidence collected in this way represents a valuable step in determining networking causes and effects, such information will also be applicable to any other international relationship between firms that cannot be strictly defined as networking. As such it represents perhaps an even more valuable piece of analysis than Hofstede's original, as inter-firm relationships and transactions are far more common, and thus their study is of considerable significance.

9.5 A Step Forward

Although research presented here cannot in itself be viewed as a model of best practice, lessons and conclusions drawn from it set a radically different research agenda for those looking towards further network – co-operation based research; an agenda which can

surely only prove to be more rewarding and revealing than the theoretical discussion and empirical counting exercises which have predominated in this field until now.

References

Adams, J. S. (1980), Interorganizational Processes and organizational boundaries activities, In: L. L. Cummings and B. M. Shaw (eds.), *Research in Organizational Behaviour Vol. 2:* Chapter 9. JAI Press: Greenwich, CONN.

Aldrich, A. A. and Whetten, D. A. (1981), Organization-Sets, Action Sets, and Networks: Making the most of Simplicity, In: Nystrom, P. C. and Starbuck, W. H. (eds.), *Handbook of Organizational Design I,* Oxford University Press: Oxford, pp. 385-408.

Aldrich, H., Reese, P. R. Durbini, P., Rosen, B. & Woodward, B. (1989), Women on the verge of a Breakthrough: Networking Between Entrepreneurs in the United States and Italy. Paper presented to the 1989 *Babson Entrepreneurship Conference,* St. Louis, USA.

Aldrich, H., Rosen, B. & Woodward, B. (1986), *A Social Role Perspective of Entrepreneurship: Preliminary Findings from an Empirical Study,* Unpublished paper, Chapel Hill, University of South Carolina.

Aldrich, H. & Zimmer, C. (1986), Entrepreneurship through Social Networks, In: D. L. Sexton & R. W. Smilor (eds), *Art and Science of Entrepreneurship,* Ballinger, Cambridge: MASS, pp. 3-23.

Allen, M. P. (1974), The Structure of Interorganizational elite cooptation: interlocking corporate directors, *American Sociological Review,* Vol. 39, pp. 393-406.

Allen, N. J. & Meyer, J. P. (1990), The measurement and antecedents of affective, continance and normative commitment to the organization, *Journal of Occupational Psychology,* Vol. 63, pp. 1-18.

Allport, G. W. (1966), Traits Revisited, *American Psychologist,* Vol. 21, pp. 1-10.

Allport, G. W. (1961), *Pattern and growth in personality,* Holt, Rinehart and Winston, New York.

Allport, G. W. (1937), *Personality: A Psychological Interpretation,* Holt, New York.

Allport, G. W. and Odbert, H. S. (1936), Trait-Names: A Psycho-lexical Study, *Psychological Monographs,* Vol. 47, No. 211, pp. 1-171.

Anderson, C. R. (1977), Locus of Control, coping behaviors, and performance in a stress setting: A Longitudinal Study, *Journal of Applied Psychology,* Vol. 62, No. 4, pp. 446-451.

Anderson, J. C., Hakansson, H. and Johanson, J. (1994), Dyadic business relationships within a business network context, *Journal of Marketing,* Vol. 58, October, pp. 1-15.

Atkinson, R. L., Atkinson, R. C., Smith, E. E., Bem, D. J. and Nolen-Hoeksema, S. (1996), *Hilgard's Introduction to Psychology,* Harcourt Brace & Company, Orlando: FL.

Aviram, A. and Milgram, R. M. (1977), Dogmatism, locus of control, and creativity in

children educated in the Soviet Union, the United States, and Israel, *Psychological Reports*, Vol. 40, pp. 27-34.

Axelrod, R. (1984), *The Evolution of Cooperation*, New York: Basic Books.

Axelsson. B. and Easton, G. (1992), Introduction, In: Axelsson. B. and Easton, G. (1992) (eds.), *Industrial Networks - A New View of Reality*, Routledge: London, pp. xiv-xvi.

Axelsson, B. (1992a), Network Positions and Strategic Action - An Analytical Framework, In: G. Easton & B. Axelsson (eds.), *Industrial Networks: A New View of Reality*, Routledge, London.

Axelsson, B. (1992b), Network Research - Future Issues, In: Axelsson. B. and Easton, G. (1992) (eds.), In: *Industrial Networks - A New View of Reality*, Routledge: London, pp. 237-251.

Ayliffe, R. (1995), Partnering will it deliver for you? *Logistics Focus*, Vol. 3, No. 2, pp. 7-9.

Bachrach, R. & Peterson, R. A. (1976), Test-retest reliability and interrelation among three locus of control measures for children, *Perceptual and Motor Skills*, Vol. 43, No. 1, pp. 260-262

Bandura, A. (1977), *Social Learning Theory*, Prentic-Hall: Englewood Cliffs, NJ.

Barber, T. X. (1976), *Pitfalls in Human Research - Ten Pivotal Points*, Pergamon Press: Oxford.

Barley, S. R., Freeman, J. & Hybels, R. C. (1992), Strategic Alliances in Commercial Biotechnology, In: N. Nohria & R. G. Eccles (Eds), *Networks and Organisations - Structure, Form and Action*, Harvard Business School Press, Boston, pp. 311-347

Barlow, H. D. (1993), From fiddle factors to networks of collusion: Charting the waters of small business crime, *Crime Law and Social Change*, Vol. 20, No. 4, pp.319-333.

Barnes, J. A. (1969), Networks and Political Process, In: J. C. Mitchell, *Social Networks in Urban Situations - Analyses of Personal Relationships in Central African Towns*, Manchester University Press, Manchester, pp. 51-76.

Barrick, M. R. and Mount, M. K. (1991), The Big Five personality dimensions and job performance: A meta-analysis, *Personnel Psychology*, Vol. 44, pp. 1-26.

Barzini, L. (1984), *The Europeans*, Penguin Books, Harmondsworth.

Bate, S. P. (1997), Whatever happened to Organizational Anthropology? A Review of the Field of Organizational Ethnography and Anthropological Studies, *Human Relations*, Vol. 50, No. 9, pp. 1147-1175.

Bateman, T. S. and Carnet, J. M. (1993), The Proactive Component of Organizational Behavior, *Journal of Organizational Behavior*, Vol. 14, pp. 103-118.

Becker, H. S. (1960), Notes on the Concept of Commitment, *American Journal of*

Sociology, Vol. 66, pp. 32-42.

Begley, T. M. and Boyd, D. P. (1987), Psychological characteristics associated with performance in entrepreneurial firms and smaller businesses, *Journal of Business Venturing*, Vol. 2, pp. 79-93.

Bem, D. (1983), Towards a response style theory of persons in situations, In: M. Page (Ed.), *Nebraska Symposium on Motivation 1982*, University of Nebraska Press, Lincoln.

Berkeley, G. (1988), *Principles of Human Knowledge / Three Dialogues*, Penguin: Harmondsworth.

Berschield, E. & Walster, E. (1969), *Interpersonal Attraction*, Addison-Wesley, Reading: Mass.

Bevan, J., Clark, G., Banjeri, N. & Hakim, C. (1989), Barriers to Business Start-up, A Study of the Flow into and out of Self -Employment, *Department of Employment Research Paper No. 71*, London, Department of Employment.

Biemans, W. G., (1992), *Managing Innovation within Networks*, Routledge, London.

Birley, S. (1985), The Role of Networks in the Entrepreneurial Process, *Journal of Business Venturing*, Vol. 1, pp. 107-117.

Birley, S. & Cromie, S. (1988), Social Networks and Entrepreneurship in Northern Ireland, *Enterprise in Action Conference*, Belfast.

Birley, S., Cromie, S., Myers, A. (1991), Entrepreneurial Networks: Their Emergence in Ireland and Overseas, *International Small Business Journal*, Vol. 9 No. 4, pp. 56-74

Blackburn, A., Curran, J., Jarvis, R. (1991), Small firms and local networks: Some theoretical and conceptual explorations, In - *Towards the Twenty-First Century - The Challenge for Small Business* edited by M. Robertson, E. Chell, C. Mason, Nadamal Books, pp. 105-122

Blackburn, S. (1994), *The Oxford Dictionary of Philosophy*, Oxford University Press: Oxford.

Blau, P. (1964), *Exchange and Power in Social Life*, John Wiley & Sons, New York.

Block, J. (1977), Advancing the psychology of personality: Paradigmatic shift or improving the quality of research? In: B. M. Foss (ed.), *Determinants of infant behavior*, Meuthen, London, pp. 111-136.

Blois, K. J. (1990), Transaction costs and networks, *Strategic Management Journal*, Vol. 11, pp. 493-496.

Bogdan, R. and Taylor, S. J. (1975), *Introduction to Qualitative Research Methods*, Wiley: New York.

Bohman, J. (1991), *New Philosophy of Social Science*, Polity: Cambridge.

Boissevain, J. (1974), *Friends of Friends: Networks, Manipulators, and Coalitions,* St. Martins, New York.

Bonoma, T. V. (1985), Case Research in Marketing: Opporunities, Problems, and a Process, *Jounral of Marketing Research,* Vol. 22, pp. 199-208.

Bouchikhi, H. (1993), A constructivist framework for understanding entrepreneurial performance, *Organization Studies,* Vol. 14, No. 4, pp. 549-570.

Bowers, K. S. (1973), Situationism in psychology: an analysis and critique, *Psychological Review,* Vol. 80, pp. 307-336.

Boyd, B. (1990), Corporate Linkages and Organizational Environments: A test of the Resource Dependence Model, *Strategic Management Journal,* Vol. 11, pp. 419-30.

Bramel, D. (1969), Interpersonal attraction, hostility and perception, In: *Experimental Social Psychology,* J. Mills (ed.), Macmillan, New York.

Bridgewater, S. (1992), Informal Networks as a vehicle for International Market Entry, *Warwick Business School Research Bureau, No. 54.*

Briggs, S. R. (1992), Assessing the Five-Factor Model of Personality Description, *Journal of Personality,* Vol. 60, No. 2, pp. 253-293.

Brockhaus, R. H. (1981), The Authoritarian Entrepreneur, In: Vesper, K. H. (Ed.), *Frontiers of Entrepreneurship Research 1981*, Babson College, Wellesley, 1981, pp. 457-462

Brockhaus, R. H., (1980a), Risk Taking Properties of Entrepreneurship, *Academy of Management Journal,* Vol. 23, No. 3, pp. 509-520.

Brockhaus, R. H., (1980b), Psychological and Environmental Factors Which Distinguish the Successful from the Unsuccessful Entrepreneur: A longitudinal Study, *Academy of Management Proceedings*, 1980, pp. 368-372.

Brodrib, C. A. (1967), *Management of the Smaller Firm in Australia,* Unpublished PhD Thesis, University of Melbourne.

Brown, R. (1965), *Social Psychology,* Free Press, New York.

Brown, S. (1995), *Postmodern Marketing,* Routledge: London.

Bryson, J., Wood, P. & Keeble, D. (1993), Business Networks, Small Firm Flexibility and Regional Development in UK Business Services, *Entrepreneurship and Regional Development,* Vol. 5, No. 3, pp. 265-277.

Buchanan, B. (1974), Building Organizational Commitment: The socialization of managers in work organizations, *Administrative Science Quarterly,* Vol. 19, pp. 533-546.

Burgess, T. F. and Gules, H. K. (1998), Buyer-supplier relationships in firms adopting advanced manufacturing technology: An empirical analysis of the implementation of hard

and soft technologies, *Journal of Engineering and Technology Management*, Vol. 15, No. 2-3, pp. 127-152.

Burt, R. S. (1982), A Note on Cooptation and Definitions of Constraint, In: P. V. Marsden & N. Lin (eds), *Social Structure and Network Analysis*, Sage Publications, Beverley Hills, pp. 219-234.

Burt, R. S., Christman, K. P. & Kilburn (Jnr.), H. C. (1980), Testing a structural theory of corporate cooptation: interorganizational directorate ties as a strategy for avoiding market constraints on profits, *American Sociological Review*, Vol. 45, pp. 821-841.

Buss, A. H. and Plomin, R. (1984), *Temperament: Early developing personality traits*, Lawrence Erlbaum, Hillsdale: NJ.

Butcher , J. N. and Rouse, S. V. (1996), Personality: Individual Differences and Clinical Assessment, *Annual Review of Psychology*, Vol. 47, pp. 87-111.

Buttle, F. (ed.) (1996), *Relationship Marketing: Theory and Practice*, Paul Chapman: London.

Caird, S. P. (1993), What do psychological tests suggest about entrepreneurs? *Journal of Managerial Psychology*, Vol. 8, No. 6, pp. 11-20.

Caird, S. P. (1989a), Report on the development and validation of a measure of general enterprising tendency, *Durham University Business School Occasional Paper No. 8913.*

Caird, S. P. (1989b), A review of methods of measuring enterprise attributes, *Durham University Business School Occasional Paper No. 8914.*

Caird, S. P. (1988), Report on the Development and Validation of a Measure of General Enterprising Tendency, *Durham Business School*, Occasional Paper 8913.

Campbell, D. T. (1978), Qualitative Knowing in Action Research, in M. Brenner *et al.* (eds.), *The Social Context of Method*, St. Martin's Press: New York.

Carland, J. W. (1982), Entreprenuership in a Small Business Setting: an Exploratory Study, *Dissertation Abstracts International*, Vol. 43, No. 6, pp. 2024-A.

Carland, J. W., Hoy, F. and Carland, J. C. (1988), "Who is an Entrepreneur?" Is a question worth asking, *American Journal of Small Business*, Spring, pp. 33-46.

Carmichael, A. (1991), *Network and multi-level marketing*, Cox & Wyman, Reading.

Carnet, J. M. (1995), The Proactive Personality Scale and Objective Job Performance Among Real Estate Agents, *Journal of Applied Psychology*, Vol. 80, No. 4, pp. 532-537.

Carson, D. J., Cromie, S. McGowan, P. and Hill, J. (1995), *Marketing and Entrepreneurship in SMEs*, Prentice-Hall: London.

Casrud, A. L. (1986), Entrepreneurs - Mentors, Networks, and Successful New Venture Development: An Exploratory Study, In: *Frontiers of Entrepreneurship Research*, R. Ronstadt, et al (Eds), Wellesley M.A. : Centre for Entrepreneurial Studies, Babson College,

1986, pp. 229-235

Casson, M. C. (1982), *The Entrepreneur - An Economic Theory*, Martin Robertson & Company Ltd, Oxford.

Casson, M. and Cox, H. (1997), An economic model of inter-firm networks, In: Ebers, M. (1997), *The Formation of Inter-Organization Networks*, Oxford University Press: New York, pp. 174-196.

Cattel, R. B. (1975), *Personality and mood by questionnaire*, Jossey-Bass, San Francisco: CA.

Cattel, R. B. (1943), The description of personality II: Basic Traits resolved into clusters, *Journal of Abnormal and Social Psychology*, Vol. 38, pp. 476-507.

Chadwick, B. A., Bahr, H. M. and Albrecht, S. L. (1984), *Social Science Research Methods*, Prentice-Hall: Englewood Cliffs.

Chapman, M. (1994), Social exclusion and urban policy: a new agenda from Europe, *Societies in Transition: Social Change in the Countryside Conference*, 29th – 30th June.

Chaston, I. (1995), Danish Technological Institute SME sector networking model: implementing broker competencies, *Journal of European Industrial Training*, Vol. 19, No. 1, pp. 10-17.

Chell, E., Haworth J. M. & Brearley, S. (1991), The Entrepreneurial Personality - Concepts, Cases and Categories, Routledge, London, 1991.

Cole, J. L. (1974), The Relationship of Selected Personality Variables to Academic Achievement of average aptitude third graders, *Journal of Educational Research*, Vol. 67, No. 7, pp. 329-333.

Coleman, J. S. (1990), *Foundations of Social Theory*, Cambridge, MA: The Belknap Press.

Collins, T. M, and Doorley, T.L., *Teaming up for the 90s*, Irwin: Homewood - Illinois.

Comrey, A. L. (1970), *Manual for the Comrey Personality Scales*, Educational and Industrial Testing Service, San Diego: CA.

Comte, A. (1830-42), *A System of Positive Philosophy*, 3 Vols., George Bell: London.

Conley, J. J. (1984a), The hierarchy of consistency: A review and model of longitudinal findings on adult individual differences in intelligence, personality, and self opinion, *Personality and Individual Differences*, Vol. 5, pp. 11-26.

Conley, J. J. (1984b), Relation of temporal stability and cross-situational consistency in personality: Comment on the Mischel-Epstein debate, *Psychological Review*, Vol. 91, pp. 491-496.

Conley, J. J. (1984c), Longitudinal Consistency of Adult Personality: Self-Reported

Psychological Characteristics Across 45 Years, *Journal of Personality and Social Psychology,* Vol. 47, No. 6, pp. 1325-1333.

Coombes, R. (1994), *Core Competencies and the Strategic Management of R&D, Presented to the R&D Decisions: Policy, Strategy and Disclosure Conference,* Keele University, 21st -22nd September 1994.

Cook, K. S. (1981), *Network Structure from Exchange Perspectives in Social Structure and Network Analyses,* Sage: Beverly Hills, CA.

Cook, K. S. (1977), Exchange and Power in Networks of Interorganisational Relations, *Sociological Quarterly,* Vol. 18, Winter, pp. 62-82.

Cook, K. S. and Emerson, R. (1984), Exchange networks and the analysis of complex organizations, *Research in the Sociology of Organizations,* Vol. 3, pp. 1-30.

Cook, K. S. and Emerson, R. (1981), Power, Equity and Commitment in Exchange Networks, *American Sociological Review,* Vol. 43, pp. 712-39.

Cook, P. (1994), Reinventing the Region: Firms, Clusters and Networks in Economic Development, *Centre for Advanced Studies,* July.

Costa, P. T. (Jnr) and McCrae, R. R. (1994), Set like plaster? Evidence for the stability of adult personality, In: T. F. Heatherton & J. L. Weinberger (Eds.), *Can personality change?* American Psychological Association, Washington D.C., pp. 21-40.

Costa, P. T. (Jnr) and McCrae, R. R. (1992a), Trait psychology comes of age, In: T. B. Sonderegger (Ed.), *Nebraska Symposium on Motivation: Psychology and Ageing,* University of Nebraska Press, Lincoln, pp. 169-204.

Costa, P. T. (Jnr) and McCrae, R. R. (1992b), *NEO-PI-R and NEO-FFI Professional Manual,* Psychological Assessment Resources, Odessa: FL.

Costa, P. T. (Jnr) and McCrae, R. R. (1989), *NEO-PI / FFI manual supplement,* Psychological Assessment Resources, Odessa: FL.

Costa, P. T. (Jnr) and McCrae, R. R. (1988), Personality in adulthood: A six-year longitudinal study of self-reports and spouse ratings on the NEO personality inventory, *Journal of Personality and Social Psychology,* Vol. 54, pp. 853-863.

Costa, P. T. (Jnr) and McCrae, R. R. (1985), *The NEO Personality Inventory Manual,* Psychological Assessment Resources, Odessa: FL.

Covin, J. G. & Slevin, D. P., (1989), Strategic Management of Small Firms in Hostile and Benign Environments, *Strategic Management Journa*l, Vol. 10, pp. 75-87

Covin, J. G. & Slevin, D. P., (1988), The Influence of Organization Structure on the Utility of an Entrepreneurial Top Management Style, *Journal of Management Studies,* Vol. 25, No. 3, pp. 217-234

Covin, J. G. & Slevin, D. P., (1986), The Development and Testing of an Organizational-Level Entrepreneurship Scale, In: Ronstadt, R. et al (Eds), Frontiers of Entrepreneurship

Research, Wellesley M.A., Centre for Entrepreneurial Studies, Babson College, pp. 628-639

Crabtree, J. R. and Miller, W. L. (1992), *Doing Qualitative Research,* Sage: Newbury Park, CA.

Cromie, S. & Ayling, S. (1988), The Motivation, Satisfaction and Company Goals of Business Proprietors, In: R. Mansfield (ed.), *Frontiers of Management,* Routledge, London.

Cromie, S., Birley, S. & Callaghan, I. (1993), Community Brokers: Their Role in the Formation and Development of Business Ventures, *Entrepreneurship and Regional Development,* Vol. 5, No. 3, pp. 247-264.

Curran, J. (1987), *Small Enterprises and their Environments A Report,* Kingston Upon Thames, Small Business Research Unit, Kingston University.

Curran, J., (1986), *Bolton Fifteen Years On: A Review and Analysis of Small Business Research in Britain 1971-1986,* Small Business Research Trust.

Curran, J., Jarvis, R., Blackburn, R. A. and Black, S. (1992), Networks and small firms: Constructs, Methodological Strategies and Some Findings, *International Small Business Journal,* Vol. 11, No. 2, pp. 13-25.

Curran, J., Jarvis, R., Blackburn, R. A. and Woods, A. (1991), *Profiles of the small service sector enterprises,* Kingston upon Thames, ESRC Centre for Research on Small Service Sector Enterprises, Kingston Polytechnic.

Dailey, R. C. (1978), Relationship between locus of control, perceived group cohesiveness, and satisfaction with coworkers, *Psychological Reports,* Vol. 42, No. 1, pp. 311-316.

Davies, G. (1996), Supply-Chain Relationships, In: F. Buttle (ed.), *Relationship Marketing: Theory and Practice,* Paul Chapman: London, pp. 17-28.

Day, G. S. (1991), Learning about markets, *Marketing Science Institute Report,* No. 91-117, Camridge, MA: Marketing Science Institute.

Deeks, J. (1976), *The Small Firm Owner-Manager - Entrepreneurial Behavior and Management Practice,* Praeger Publishers, New York.

Deutsch, M. (1969), The effect of motivational orientation on trust and suspicion, *Journal of Social Issues,* Vol. 25, No. 1, pp. 7-41.

Deutsch, M. (1958), Trust and Suspicion, *Journal of Conflict Resolution,* Vol. 2, September, pp. 265-279.

Digman, J. M. (1989), Five Robust Trait Dimensions: Development, Stability, and Utility, *Journal of Personality,* Vol. 57, No. 2, pp. 195-214.

Digman, J. M. (1979), The five major domains of personality variables: Analysis of questionnaire data in light of the five robust factors emerging from studies of rated characteristics, Paper presented to the *Annual Meeting of the Society of Multivariate Experimental Psychology,* Los Angeles, August.

Digman, J. M. and Takemoto-Chock, N. K. (1981), Factors in the natural language of personality: Re-analysis, comparison and interpretation of six major studies, *Multivariate Behavioral Research,* Vol. 16, pp. 149-170.

Dixon, D. N. *et al.* (1976), Dimensionality of three adult, objective locus of control scales, *Journal of Personality Assessment,* Vol. 40, No.3, pp. 310-319.

Donaldson, L. (1997), A Positivist Alternative to the Structure-Action Approach, *Organization Studies,* Vol. 18, No. 1, pp. 77-92.

Doucette, W. R. (1998), Influences on member commitment to group purchasing organizations, *Journal of Business Research,* Vol. 40, No. 3, pp. 183-189.

Downey, H. K. and Ireland, R. D. (1979), Quantitative versus Qualitative: Environmental Assessment in Organizational Studies, *Administrive Science Quarterly,* Vol. 24, pp. 630-637.

Dowst, S. (1989), Partnering Continues to Get High Marks from Both Sides, *Purchasing,* Vol. 106, No. 7, pp. 46-51.

Dubini, P. and Aldrich, H. (1991), Personal and extended networks are central to the entrepreneurial process, *Journal of Business Venturing,* Vol. 6, pp. 305-313.

Duffy, P. J. *et al* (1977), Locus of Control: Dimensionality and predictability using Likert Scales, *Journal of Applied Psychology,* Vol. 62, No. 2, pp. 214-219.

Duke, M. & Nowicki, S. (1973), Personality correlates of the Nowicki-Strickland locus of control scale for adults, *Psychological Reports,* Vol. 33, No. 1, pp. 267-270.

Dunham, R. B., Grube, J. A. & Castañeda, M. B. (1994), Organizational Commitment: The Utility of an Integrative Definition, *Journal of Applied Psychology,* Vol. 79, No. 3, pp. 370-380.

Dunkelberg, W. C. & Cooper, A. C. (1982), Entrepreneurial typologies: an empirical study, In: K. H. Vesper (ed.) *Frontiers of Entrepreneurial Research,* Babson College, Wellesley: Mass, pp. 1-15.

Dwyer, F., Scurr, P. & Oh, S. (1987), Developing Buyer-Seller Relationships, *Journal of Marketing,* Vol. 51, April, pp. 11-27.

Dyson, P. (1994), *Novell's Dictionary of Networking,* Novell Press, London.

Easterby-Smith M., Thorpe, R. & Lowe, A. (1994), *Management Research - An Introduction,* Sage: London.

Ebers, M. (1997), Explaining Inter-organizational network formation, *The Formation of Inter-Organization Networks,* Oxford University Press: New York, pp. 3-40.

Endler, N. S. (1983), Interactionism: a personality model, but not yet a theory, In: M. Page (Ed.), *Nebraska Symposium on Motivation, Personality - Current Theory and Research,* pp. 155-200, University of Nebraska Press, Lincoln.

Endler, N. S. and Magnusson, D. (1976), *Interactional Psychology and Personality,* Hemisphere, New York.

Epstein, A. (1969), The Network and Urban Social Organisation, In: J. C. Mitchell (ed.), *Social Networks in Urban Situations,* Manchester University Press, Manchester, pp. 77-127.

Erikson, E. (1965), *Childhood and Society,* Penguin, Harmondsworth.

Esterson, A. (1993), *Seductive mirage: An exploration of the work of Sigmund Freud,* Open Court, Chicago, IL.

European Observatory for SMEs (1992), *First Annual Report,* European Network for SME Research - European Commision.

Eysenck, H. J. (1995), Trait theories of personality, In S. E. Hampson and A. M. Colman (Eds.), *Individual Differences and Personality,* pp. 40-58, Longman, New York.

Eysenck, H. J. (1970), *The Structure of Human Personality,* Methuen, London.

Eysenck, H. J. (1967), *The biological basis of personality,* Charles C. Thomas, Springfield, IL.

Eysenck, H. J. and Rachman, S. (1965), *The Causes and Cures of Neuroses,* Routledge & Keegan Paul, London.

Fargher, K. (1971), *Problems of Small Manufacturing Businesses - Australia,* PhD Thesis, University of New South Wales.

Feji, J. A. (1975), Construct Validation of a fear-of-failure measure using an operant type of behaviour, *Psychological Reports,* Vol. 37, No. 3, pp. 1147-1151.

Fells, R. E. (1993), Developing Buyer-Seller Relationships, *Journal of Marketing,* Vol. 15, No. 1, pp. 33-45.

Filion, L. J. (1990), Entrepreneurial Performance, Networking, Vision and Relations, *Journal of Small Business and Entrepreneurship,* Vol. 7, No. 3, pp. 3-13.

Filstead, W. J. (1970), *Qualitative Methodology,* Rand McNally: Chicago.

Fiske, D. W. (1949), Consistency of the factorial structures of personality from different sources, *Journal of Abnormal and Social Psychology,* Vol. 44, pp. 329-344.

Fitz-Gibbon, C. T. & Morris, L. L. (1986), *How to analyse data,* Sage, Newbury Park.

Fombrun, C. J. (1982), Strategies for Network Research in Organizations, *Academy of Management Review,* Vol. 7, pp. 280-291.

Ford, D. (ed.) (1998), *Managing Business Relationships,* Wiley: Chichester.

Ford, D. (ed.) (1990), *Understanding Business Markets: Interaction, Relationships and Networks,* Academic Press: London.

Freud, S. (1900), *The Interpretation of Dreams,* Standard Edition J. Strachey (Trans.) Vols. IV and V, Hogarth, London.

Freud, S. (1901), *The Psychopathology of Everyday Life,* Standard Edition J. Strachey (Trans.) Vol. VI, Hogarth, London.

Fukuyama, F. (1995), *Trust: The Social Virtues and the Creation of Prosperity,* Penguin Books, Harmondsworth.

Galton, S. F. (1884), Measurement of Character, *Fortnightly Review,* Vol. 42.

Geyskens, I., Steenkamp, J-B. E. M. and Kumar, N. (1998), Generalizations about trust in marketing channel relationships using meta-analysis, *International Journal of Research in Marketing,* Vol. 15, No. 3, pp. 223-248.

Giddens, A. and Turner, J. (1987), *Social Theory Today,* Polity Press: Oxford.

Gilleard, C. J. (1989), The achieving society revisited: A further analysis of the relation between national economic growth and need achievement, *Journal of Economic Psychology,* Vol. 10, No. 1, pp. 21-34.

Ginsberg, A. and Buchholtz, A. (1989), Are entrepreneurs a breed apart? A look at the evidence, *Journal of General Management,* Vol. 15, No. 2, pp. 32-40.

Glaser, B. G. and Strauss, A. L. (1967), *The Discovery of Grounded Theory: Strategies for Qualitative Research,* Sociology Press: Mill Valley, CA.

Glazer, M. (1972), *The Research Adventure-Promise and Problems of Field Work,* Random House: New York.

Glazer, R. (1991), Marketing in an Information-Intensive Environment: Strategic Implications of Knowledge as an Asset, *Journal of Marketing,* Vol. 55, October, pp. 1-19.

Gleick, J. (1996), *Chaos – The Amazing Science of the Unpredictable,* Mandarin, London.

Goldberg, L. R. (1990), *Standard markers of the Big-Five structure,* Unpublished manuscript, Oregon Research Institute.

Goldberg, L. R. (1982), From Ace to Zombie: Some explorations in the language of personality, In C. D. Spielberger and J. N. Butcher (Eds.), *Advances in Personality Assessment,* Vol. 1, pp. 203-234, Erlbaum, Hillsdale.

Gordon, D. A. (1977), Children's beliefs in internal-external control and self-esteem as related to academic achievement, *Journal of Personality Assessment,* Vol. 41, No. 4, pp. 383-386.

Gough, H. G. (1964), *Manual for the California Personality Inventory,* Consulting Psychologists Press, Palo Alto: CA.

Grandori, A. and Soda, G. (1995), Inter-firm Networks: Antecedents, Mechanisms and Forms, *Organization Studies,* Vol. 16, No. 2, pp. 183-214.

Granovetter, M. S. (1973), The Strength of Weak Ties, *American Journal of Sociology,* Vol. 78, No. 6, pp. 1360-1380.

Gray, C. (1993), Growth-orientation and the small firm, In: K. Caley, E. Chell, F. Chittenden and C. Mason (Eds.), *Small Enterprise Development: Policy and Practice in Action,* Paul Chapman, London, pp. 59-71.

Gray, C. (1991), Growth Orientation and the Small Firm, Paper presented to the *14th ISBA National Small Firms Policy and Research Conference,* Blackpool.

Green, J. A. S., Brupacher, J. & Goldheim, D. (1990), Strategic Partnership Aids Technology Transfer, *Research Technology Management,* Vol. 34, No. 4, pp. 26-31.

Guilford, J. P. (1975), Factors and factors of personality, *Psychological Bulletin,* Vol. 82, pp. 802-814.

Gummesson, E. (1994), Making relationship marketing operational, *International Journal of Service Industry Management,* Vol. 5, pp. 10-20.

Halfpenny, P. (1982), *Positivism and Sociology,* Allen and Unwin: London.

Hallinan, M. T. (1978), The process of friendship formation, *Social Networks,* Vol. 24, pp. 193-210.

Hakansson, H. (1993), Managing co-operative research and development: Partner selection and contract design, *R & D Management,* Vol. 23, No. 4, pp. 273-285.

Hakansson, H.(1992), Evolution Processes in Industrial Networks, In: G. Easton & B. Axelsson (eds.), *Industrial Networks: A New View of Reality,* Routledge, London.

Hakansson, H. (1993), Managing co-operative research and development: Partner selection and contract design, *R & D Management,* Vol. 23, No. 4, pp. 273-285.

Hakansson, H. (ed.) (1982), *International Marketing and Purchasing of Industrial Goods: An Interaction Approach,* Wiley: Chichester.

Hakansson, H. and Johansson, J. (1993), The Network as a governance structure - Interfirm cooperation beyond markets and hierarchies, In: Grabher, G. (1993) (ed.), *The Embedded Firm: On the Socioeconomics of Industrial Networks,* Routledge: London, pp. 35-51.

Hakansson, H. & Johanson, J. (1988), Formal and informal cooperation strategies in international industrial networks, In: F. J. Contractor, and P. Lorange (Eds), *Cooperative Strategies in Business,* Lexington Books, Massachusetts, pp. 369-79.

Hakansson, H. and Snehota, I. (1989), No business is an island: the network concept of business strategy, *Scandinavian Journal of Management,* Vol. 4, pp. 187-200.

Hallen, L. Johanson, J. Mohamed, N. S. (1987), Relationship Strength and Stability in International and Domestic Industrial Marketing, *Industrial Marketing and Purchasing,* Vol. 2, No. 3, pp. 22-37.

Hallinan, M. T. (1974), The process of friendship formation, *Social Networks,* Vol. 24, pp. 193-210.

Harary, K. L. and Cartwright, D. (1965), *Structural Models,* John Wiley, New York.

Harkins, S. and Green, R. G. (1975), Discrimability and criterion differences between extroverts and introverts during vigilance, *Journal of Research in Personality,* Vol. 9, pp. 335-40.

Harland, C. M. (1996), Supply chain management: Relationships, chains and networks, *British Journal of Management,* Vol. 7, Special Issue, pp. 63-80.

Harre, R. (1986), *Varieties of Realism,* Basil Blackwell: Oxford.

Hartshorne, H. and May, M. A. (1928), *Studies in the Nature of Character,* Volume 1 of Studies in Deceit, McMillan, New York.

Head, T. (1983), *Networks: Who we know and how we use them,* Hodder & Stoughton, London.

Herbst, P. (1976), *Alternatives to Hierarchies,* Matinus Nijhoff, Leiden.

Hertz, S. (1992), Towards more integrated industrial systems, In: Axelsson. B. and Easton, G. (1992), Introduction, In: *Industrial Networks - A New View of Reality,* Routledge: London, pp. 105-128.

Herzfeld, E. O. (1983), *Joint Ventures,* Jordans, Bristol.

Hewett, J. (1987), Revealing the Key to the WA Success Story, *Australian Financial Review,* 11th February, p. 2.

Hill, D. J. and Bale, R. M. (1980), Development of the Mental Health Locus of Control and Mental Health Locus of Origin Scales, *Journal of Personality Assessment,* Vol. 44, No. 2, pp. 580-585.

Hofstede, G. (1988), *Cultures Consequences - International Differencesin Work - Related Values,* Sage Publications: Beverly Hills CA.

Hogan, R. (1986), *Hogan Personality Inventory Manual,* National Computer Systems, Minneapolis.

Hogan, R. (1983), A socioanalytical theory of personality, In: M. Page (Ed.), *Nebraska Symposium on Motivation, Personality - Current Theory and Research,* University of Nebraska Press, Lincoln.

Hollenbeck, J. R., Williams, C. R. & Klein, H. J. (1989), An Empirical Examination of the Antecedents of Commitment to Difficult Goals, *Journal of Applied Psychology,* Vol. 74, No. 1, pp. 18-23.

Holm, D. B., Eriksson, K. and Johanson, J. (1996), Business Networks and Cooperation in International Business Relationships, *Journal of International Business Studies,* Special Issue,, pp. 1033-1053.

Holmes, S. (1995), Network Formation – Soft Networks and Hard Networks, In: *Business Networks, Business Growth Conference Proceedings*, Sydney, October, pp. 36-39.

Hoselitz, B. F. (1952), Entrepreneurship and Economic Growth, *American Journal of Economic Sociology,* Vol. 12.

Howard, K. and Sharp, J. A. (1983), *The Management of a Student Research Project,* Gower: Aldershot.

Hrebiniak, L. G. & Alutto, J. A. (1972), Personal and role related factors in the development of organizational commitment, *Administrative Science Quarterly,* Vol. 17, pp. 555-573.

Hsieh, T. Y, Skyhut, J. & Lotsof, E. J. (1969), Internal versus external control and ethnic group membership: a cross-cultural comparison, *Journal of Consulting and Clinical Psychology,* Vol. 33, pp. 122-124.

Hughes, J. (1990), *The Philosophy of Social Research - 2nd Ed.*, Longman: Harlow.

Hulten, S., Lundgren, A., (1986), Uncertainty and Networks - Some Thoughts on How Organisations Handle Uncertainty through Relationships, *International Marketing and Purchasing Group: 3rd International I.M.P. Research Seminar on International Marketing,* pp. 1-15.

Humble, B. (1992), *Corporate Vales - The Bottom Line Contribution: A Survey of Executive Opinion in the United Kingdom,* Digital Equipment Company.

Hunt, S. D. (1990), Truth in marketing theory and research, *Journal of Marketing,* Vol. 54, No. 3, pp. 1-15.

Hunter, J. E. (1979), Towards a general framework for dynamic theories of sentiment in small groups derived from theories of attitude change, In: P. W. Holland & S. Leinhardt (eds.) *Perspectives on Social Network Research,* Academic, New York, pp. 223-238.

Husserl, E. (1962), *Ideas,* Collier, New York.

Hussey, J. & Hussey, R. (1997), *Business Research -A practical guide for undergraduate and postgraduate students,* Macmillan: Basingstoke.

Iacobucci, D. and Hopkins, N. (1992), Modelling dyadic interactions and networks in marketing, *Journal of Marketing,* Vol. 29.

Ivancevich, J. M. (1980), A Longitudinal study of Behavioural Expectation Scales: Attitudes and Performance, *Journal of Applied Psychology,* Vol. 65, No. 2, pp. 139-146.

Jackson, B. B. (1985), Build Customer Relationships that Last, *Harvard Business Review,* Nov-Dec, pp. 120-128.

Jacobs, C. and Bosworth, D. (1989), Management Attitudes, Behaviours and Abilities as Barriers to Growth, In: Barber, t., Metcalfe, S. and Porteous, M. (eds) *Barriers to Growth in Small Firms,* Routledge: London.

Jarillo, J. C., (1989), Entrepreneurship and Growth: The Strategic Use of External Resources, *Journal of Business Venturing,* Vol. 4, No. 2, pp. 133-147

Jarillo, J., (1988), On Strategic Networks, *Strategic Management Journal,* Vol. 9, pp. 31-41

Jarillo, J.R. & Ricart, J.E. (1987), Sustaining Networks, *Interfaces,* Vol. 17, No. 5, pp. 82-91.

Jick, T. D. (1979), Mixing Qualitative and Quantitative Methods: Triangulation in Action, *Adminstrative Science Quarterly,* Vol. 24, pp. 602-611.

Johannisson, B., (1990) 'Economies of Overview - Guiding the External Growth of Small Firms', International Small Business Journal, Vol. 9, No. 1, pp.32-44.

Johannisson, B. (1987a), Beyond Process and Structure Social Exchange Networks, *Entrepreneurship & Regional Development,* Vol. 6, pp. 329-356.

Johannisson, B. (1987b), Anarchists and Organizers: Entrepreneurs and a Network Perspective, *International Studies of Management and Organization,* Spring, Vol. 17, No.1, pp. 49-63

Johannisson, B. (1986), Network Strategies: Management technology for entrepreneurship and change, *International Small Business Journal,* Vol. 5, No. 1, pp. 19-30.

Johannisson, B. & Johnsson, T. (1988), *New Venture Network Strategies,* Reports from Vaxjo University, Ser. 1 Economy and Politics 18, Vaxjo University, Sweden

John, G. (1984), An Empirical Investigation of Some of the Antecedents of Opportunism in a Marketing Channel, *Journal of Marketing Research,* Vol. 21, August, pp. 304-324.

John, O. P., Angleitner, A. and Ostendorf, F. (1988), The lexical approach to personality: a historical review of trait taxonomical research, *European Journal of Personality,* Vol. 2, pp. 171-203.

Johne, A. and Rowntree, S. (1991), High technology product development in small firms: A challenge for marketing specialists, *Technovation,* Vol. 11, No. 4, pp. 247-258.

Johnson, B. R. (1990), Towards a multidimensional model of entrepreneurship: The case of achievement motivation and the entrepreneur, *Entrepreneurship: Theory and Practice,* Vol. 14, No. 3, pp. 39-54.

Johnson, D. & Ma, Rosa (1995), Research Note: A Method for Selecting and Training Entrants on New Business Start-up Programmes, *International Small Business Journal,* Vol. 13, No. 3, pp. 80-84.

Johnson, D. & Ma, Rosa (1994), The Successful Entrepreneur - A Behavioural Review

and Investigation, *Small Business Centre,* Durham University Business School.

Johnston, R. and Lawrence, P. R. (1988), Beyond Vertical Integration - the Rise of the Value-Adding Patnership, *Harvard Business Review,* Vol. XXXX, July-August, pp. 94-101.

Jung, C. G. (1934-55), *The Collected Works of C. G. Jung - Volume 9i : The Archetypes of the Collective Unconscious,* H. Read, M. Fordham, G. Adler & W. McGuire (Eds.) Translated from the German by R. F. C. Hull, Routledge & Kegan Paul, London.

Kantor, J. R. (1926), *Principles of Psychology - Vol. 2,* Principia Press, Bloomington.

Kantor, J. R. (1924), *Principles of Psychology - Vol. 1,* Principia Press, Bloomington.

Kaplan, A. (1964), *Conduct of Inquiry,* Chandler Press: Scranton, PA.

Kay, N. (1992), Collaborative Strategies of the Firm: Theory and Evidence, In: A. Del Monte (ed.), *Recent Developments in the Theory of Industrial Organization,* Macmillan, Basingstoke, pp. 201-231.

Keeble, D. (1990), Small firms, new firms and uneven regional development in the United Kingdom, *Area,* Vol. 22, No. 3, pp. 234-245.

Keeble, D. (1989), High Technology Industry and Regional Development in Britain: the Case of the Cambridge Phenomenon, *Environment and Planning C: Government and Policy,* Vol. 7, pp. 153-72.

Keenan, A. & McBain, G. D. M. (1979), Effects of Type A behaviour, intolerance of ambiguity and locus of control on the relationship between role stress and work-related outcomes, *Journal of Occupational Psychology,* Vol. 52, No. 4, pp. 277-285.

Kelley, H. H. and Thibaut, J. W. (1978), *Interpersonal relations- A theory of interdependence,* John Wiley: New York.

Kets de Vries, M. F. R., (1985), The dark side of entrepreneurship, *Harvard Business Review,* November-December, 1985, pp. 160-167

Kets de Vries, M. and Miller, D. (1984), *The Neurotic Organization,* Jossey-Bass, San Francisco: CA.

King, A. S. (1985), Self analysis and assessment of Entrepreneurial Potential, *Simulation and Games,* Vol. 16, pp. 399-416.

Knoke, D. & Kuklinski, J.H. (1982), *Network Analysis,* Sage University Paper, Sage Publications, Beverley Hills.

Kogan, N. & Wallach, M. A. (1964), *Risk taking,* Holt, Rinehart & Winston, New York.

Kolar, D. W., Funder, D. C. & Colvin, C. R. (1996), Comparing the accuracy of personality judgements by the self and knowledgeable others, *Journal of Personality,* Vol. 64, No. 2, pp. 311-337.

Kotler, P. (1991), *Marketing Management: Analysis, Planning, Implementation and Control,* Prentice-Hall, Englewood Cliffs.

Krackhardt, D. & Hanson, J. R. (1993), Informal Networks: The company behind the chart, *Harvard Business Review,* July – August, pp. 104-111.

Krahé, B. (1992), *Personality and Social Psychology: Towards a Synthesis,* Sage, London.

LaGarce, R. & Kuhn, L. D. (1995), The Effect of Visual Stimuli on Mail Survey Response Rates, *Industrial Marketing Management,* Vol. 24, No. 1, pp. 11-18.

Lange, P. (1984), Unions, Workers and Wage Regulation: The Rational Bases of Consent, In: J. H. Goldthorpe (ed.), *Order and Conflict in Contemporary Capitalism; Studies in the Political Economy of Western European Nations,* Oxford University Press, Oxford, pp. 98-123.

Langfield-Smith, K. and Greenwood, M. R. (1998), Developing co-operative buyer-supplier relationships: A case study of Toyota, *Journal of Management Studies,* Vol. 35, No. 3, pp. 331-353.

Larson, A., (1991), Partner Networks: Leveraging External Ties to Improve Entrepreneurial Performance, *Journal of Business Venturing,* Vol. 6, No. 3, pp. 173-188.

Larson, P. D. (1994), Buyer-supplier co-operation, product quality and total costs, *International Journal of Physical Distribution & Logistics,* Vol. 24, No. 6, pp. 4-10.

Larson, P. D. and Kulchitsky, J. D. (1998), Single sourcing and supplier certification: Performance and relationship implications, *Industrial Marketing Management,* Vol. 27, No. 1, pp. 73-81.

Lauman, E. (1968), Interlocking and Radical Friendship Networks: A cross sectional analysis, *Mimeographed - University of Michigan,* A. Arbor.

Lauman, E., Galaskiewicz, J. & Marsden, P. V. (1978), Community structure as interorganizational linkages, In: A. Inkeles et al (eds), *Annual Review of Sociology,* Vol. 4, Annual Reviews, Palto Alto: CA, pp. 455-484.

Lei, D. (1993), Offensive and Defensive Uses of Alliances, *Long Range Planning,* Vol. 26, No. 4, pp. 32-41.

Leplin, J. (1981), Truth and Scientific Progress, *Studies in the History and Philosophy of Science,* Vol. 12, pp. 269-91.

Lewin, K. (1936), *Principles of Topological Psychology,* McGraw-Hill, New York.

Lin, N. (1975), Analysis of communication relations, In: G. J. Hanneman & W. J. McElwen (eds.), *Communication and Behaviour,* Addison-Wesley, Reading: MA, pp. 12-35.

Lincoln, J. R. & Miller, J. (1979), Work and Friendship ties in organizations: A comparative analysis of relational networks, *Administrative Science Quarterly,* Vol. 24, pp. 181-199.

Lincoln, Y. and Guba, E. (1985), *Naturalistic Inquiry,* Russell Sage: Beverley Hills, CA.

Lipnack, J. and Stamps, J. (1982), *Networking - The First Report and Directory,* Doubleday, New York.

Lloyd, P., Mayes, A., Manstead, A.S.R., Meudell, P.R. and Wagner, H.L. (1986), *Introduction to Psychology - An Integrated Approach,* Fontana Press, London.

Loevinger, J. and Knoll, E. (1983), Personality: Stages, traits and the self, *Annual Review of Psychology,* Vol. 34, pp. 195-222.

Lorenzoni, G. & Ornati, O. (1988), Constellations of Firms and New Ventures, *Journal of Business Venturing,* Vol. 3, pp 41-57.

Lorr, M. and Nerviano, V. J. (1985), Factors common to the ISI and 16PF inventories, *Journal of Clinical Psychology,* Vol. 41, pp. 773-777.

McClelland, D. C. (1981), Is personality consistent? In: A. I. Rabin, A. M. Barclay and R. A. Zucker (Eds.), *Further Explorations in Personality,* Wiley, New York, pp. 87-113.

McClelland, D. C. (1976), *The Achieving Society* (revised ed), Irvington Publishers, New York.

McClelland, D. C. (1975), *Power: The Inner Experience,* Irvington Publishers, New York.

McClelland, D. C. (1961), *The Achieving Society,* Van Nostrand, Princeton.

McClelland, D. C. & Winter, D. G. (1976), *Motivating Economic Achievement,* New York, Free Press.

McClelland, D. C., Atkinson, J. W., Clark, R. A. & Lowell, E. L. (1976), *The Achievement Motive* (revised ed.), New York, Irvington Publishers.

McCrae, R. R. & Costa, P. T. (Jnr) (1990), *Personality in adulthood,* Guilford, New York.

McCrae, R. R. & Costa, P. T. (Jnr) (1989), Reinterpreting the Myers-Briggs Type Indicator from the Perspective of the Five-Factor Model of Personality, *Journal of Personality,* Vol. 57, No. 1, pp. 17-40.

McGrath, J. E. (1982), Dilemmatics: The Study of Choices and Dilemmas, in J. E. McGrath, J. Martin, and R. A. Kulka (eds.), *Judgement Calls in Research,* pp. 69-102.

McLean, A. (1990), *Public Choice,* Basil Blackwell, Oxford.

McMartin, J. (1995), *Personality Psychology: A Student Centered Approach,* Sage, Thousand Oaks: CA.

McMullin, E. (1979), Discussion Review: Laudan's Progress and Its Problems, *Philosophy of Science,* Vol. 46, pp. 623-44.

McNeill, P. (1990), *Research Methods - 2nd Ed.*, Tavistock: London.

Macmillan, K., Curran, J., Downing, S. (1990), Government Consultation with Small Business Owners: Empirically Evaluating Communications Strategies, *International Small Business Journal,* Vol. 8 No. 4.

Magnusson, D. and Allen, V. L. (Eds.) (1983), *Human Development: An Interactionist Perspective,* Academic Press, New York.

Mariolis, P. (1975), Interlocking directorates and control of corporations, *Social Science Quarterly,* Vol. 56, pp. 425-439.

Marsden, D. and Littler, D. (1996), Evaluating Alternative Research Paradigms: A Market-Oriented Framework, *Journal of Marketing Management,* Vol. 12, pp. 645-55.

Marshall, J. F. (1971), Topics and Networks in Intra-village communication, In: S. Polgar (ed.), *Culture and Population: A Collection of Current Studies,* Monograph 9, Carolina Population Center, Chapel Hill: NC.

Martin, F. (1994), Measuring Entrepreneurial Traits and Characteristics: Experience with an Entrepreneurship Programme, *IntEnt 94,* July 4th-6th, Stirling: UK.

Martin, J. (1982), A Garbage Can Model of the Research Process, In: J. E. McGrath, J. Martin, and R. A. Kulka (eds.), *Judgement Calls in Research,* pp. 17-40.

Mason, C. M. (1985), The geography of "successful" small firms in the United Kingdom, *Environment & Planning A,* Vol. 17, pp. 1499-1513.Vol. 17, pp. 1499-1513.

Mason, C. & Harrison, R. (1995), Final Review and Evaluation of Five Informal Investment Demonstration Projects, *A Report to the Department of Trade and Industry,* November.

Mathieu, J. E. & Zajac, D. M. (1990), A Review and Meta-Analysis of the Antecedents, Correlates, and Consequences of Organizational Commitment, *Psychological Bulletin,* Vol. 108, No. 2, pp. 171-194.

Mattsson, L-G. (1989), Management of strategic change in a 'Markets-as-Networks' perspective, In: A. M. Pettigrew, *The Management of Strategic Change,* Basil Blackwell, Oxford, pp. 234-260.

Menard, S. (1995), *Applied Logistic Regression Analysis,* Sage, London.

Meyer, J. P. & Allen, N. J. (1984), Testing the "Side-Bet Theory" of Organizational Commitment: Some Methodological Considerations, *Journal of Applied Psychology,* Vol. 69, No. 3, pp. 372-378.

Miles, M. B. (1979), Qualitative Data as an Attractive Nuisance: The Problem of Analysis, *Adminstrative Science Quarterly,* Vol. 24, pp. 590-601.

Miles, R. E. & Snow, C. C., (1986), Organizations: New Concepts for New Forms, *California Management Review,* Vol. 28, No. 3, pp. 62-73

Mill, J. S. (1973), *Auguste Comte and Positivism,* Ann Arbor: University of Michigan Press.

Miller, D. (1983), The Correlates of Entrepreneurship in Three Types of Firms, *Management Science,* Vol. 29, No. 7, pp. 770-791.

Miller, D. (1981), *Philosophy and Ideology in Hume's Political Thought,* Oxford University Press: Oxford.

Miller, D. & Dröge, C. (1986), Psychological and Traditional Determinants of Structure, *Administrative Science Quarterly,* Vol. 31, pp. 539-560.

Miller, D., Kets de Vries, M. and Toulouse, J-M. (1982), Top executive locus of control and its relationship to strategy making, structure and environment, *Academy of Management Journal,* Vol. 25, pp. 237-253.

Minanahan, T. (1998), Is partnering a sham? *Purchasing,* Vol. 124, No. 2, pp. 61-64.

Miner, J. B. (1976), Relationships among measures of managerial personality traits, *Journal of Personality Assessment,* Vol. 40, No. 4, pp. 383-397.

Mintzberg, H. (1979), An Emerging Strategy of "Direct" Research, *Administrative Science Quarterly,* Vol. 24, pp. 582-589.

Mischel, W. (1974), Processes in delay of gratification, In; L. Berkowitz (Ed.), *Advances in experimental psychology - Vol. 7,* Academic Press, New York.

Mischel, W. (1968), *Personality and Assessment,* Wiley, New York.

Miskel, C. (1974), Intrinsic, extrinsic, and risk propensity factors in the work attitudes of teachers, educational administrators, and business managers, *Journal of Applied Psychology,* Vol. 59, No. 3, pp. 339-343.

Mitchell, J. C. (1969), The concept and use of social networks, pp. 1-50, In: J. C. Mitchell (ed.), *Social Networks in Urban Situations,* Manchester University Press, Manchester, pp. 1-50.

Moore, K. R. (1998), Trust and relationship commitment in logistics alliances: A buyer perspective, *International Journal of Purchasing and Materials Management,* Vol. 34, No. 1, pp. 24-37.

Moorman, C., Deshpandé, R. & Zaltman, G. (1993), Factors Affecting Trust in Market Research Relationships, *Journal of Marketing,* Vol. 57, January, pp. 81-101.

Morgan, G. and Smircich, L. (1980), The Case for Qualitative Research, *Academy of Management Review,* Vol. 5, No. 4, pp. 491-500.

Morgan, K., (1991), Innovating-by-Networking New Models of Corporate and Regional Development, Department of City and Regional Planning, University of Wales College of Cardiff, Papers in Planning Research 125

Morgan, R. M. & Hunt, S. D. (1994), The Commitment-Trust Theory of Relationship

Marketing, *Journal of Marketing,* Vol. 58, July, pp. 20-38.

Morris, J. H. & Snyder, R. A. (1979), A second look at need for achievement and need for autonomy indicators as moderators of role perception-outcome relationships, *Journal of Applied Psychology,* Vol. 64, No. 2, pp. 173-178.

Morrison, R. F. (1977), Career adaptability: The effective adaptation of managers to changing role demands, *Journal of Applied Psychology,* Vol. 62, No. 5, pp. 549-558.

Mowday, R. T., Porter, L. W. & Steers, R. M. (1982), *Employee-organization linkages: The Psychology of commitment, absenteeism and turnover,* Academic Press New York.

Mowday, R. T., Steers, R. M. & Porter, L. W. (1979), The measurement of organizational commitment, *Journal of Vocational Behavior,* Vol. 14, No. 2, pp. 224-247.

Mudambi, R. and Helper, S. (1998), The 'close but adversarial' model of supplier relations in the U.S. auto industry, *Strategic Management Journal,* Vol. 19, No. 8, pp. 775-792.

Mueller, R.K. (1986), *Corporate Networking - Building Channels for Information and Influence,* The Free Press, New York.

Muldrow, T. W. & Bayton, J. A., (1979), Men and Women Executives and Processes related to Decision Accuracy, *Journal of Applied Psychology,* Vol. 64, No. 2, pp. 99-106.

Murray, E. A., Mahon, J. F. (1993), Strategic Alliances: Gateway to the New Europe? *Long Range Planning,* Vol. 26, No. 4, pp 102 - 111.

Nemzow, M. A. W. (1993), *FDDI Networking: planning, installation and management,* McGraw-Hill, Maidenhead.

Newcomb, T. M. (1961), *The Acquaintance Process,* Holt, Reinhart & Winston, New York.

Niller, D. (1983), The Correlates of Entrepreneurship in Three Types of Firm, *Management Science,* Vol. 29, No. 7, pp. 770-793.

Nohria, N. (1992), Is a Network Perspective a Useful Way of Studying Organizations? In: Nohria, N. and Eccles, R. G. (eds.), *Networks and Organizations: Structure, Form and Action,* Harvard Business School Press, Boston: Mass, pp. 1-22.

Noller, P., Law, H., and Comrey, A. L. (1987), Factor analysis of the Comrey Personality Scales in an Australian sample, *Multivariate Behavioral Research,* Vol. 53, pp. 775-782.

Norman, W. T. (1967), *2,800 personality trait descriptors: Normative operating characteristics for a university population,* Ann Arbor: Department of Psychology, University of Michigan.

Norman, W. T. (1963), Towards an adequate taxonomy of personality attributes: Replicated factor structure in peer nomination personality ratings, *Journal of Abnormal and Social Psychology,* Vol. 66, pp. 574-583.

Norman, W. T. and Goldberg, L. R. (1966), Raters, ratees, and randomness, *Journal of Personality and Social Psychology,* Vol. 4, pp. 681-691.

Norusis, M. J. (1992), *SPSS for Windows Professional Statistics Release 5,* SPSS Inc, Chicago.

Nueno, P. & Oosterveld, J., (1988), Managing Technological Alliances, *Long Range Planning,* Vol. 21, No. 3, pp. 11-17.

Oakey, R.P. (1993), Predatory Networking: The role of Small Firms in the Development of the British Biotechnology Industry, *International Small Business Journal,* Vol. 11, No. 4, pp. 9-22

Oakey, R. P. (1993), High technology small firms: a more realistic evaluation of their growth potential. In: C. Karlsson, B. Johannisson, and D. Storey (Eds.) *Small Business Dynamics - International, national and Regional Perspectives,* Routledge, London, pp. 224-243

Oakey, R.P. & Cooper, S. Y. (1991), High Technology Industry, Agglomeration and the Potential for Peripherally Sited Small Firms, *Regional Studies,* Vol. 23, No. 4, pp. 347-360

Organisation for Economic Co-operation & Development (1994), *The OECD Jobs Study: Facts, Analysis, Strategy,* OECD, Paris.

Ouchi, W. G. (1980), Markets, Bureaucracies and Clans, *Administrative Science Quarterly,* Vol. 25, March, pp. 129-141.

Pache, G. (1990), The role of Small Business in the Development of Network Organisation: The Case of France, *International Small Business Journal,* Vol. 8 No. 4, pp. 71-76.

Pandrey, J. and Tewary, N. B. (1979), Locus of control and achievement values of entrepreneurs, *Journal of Occupational Psychology,* Vol. 52, pp. 107-111.

Pavia, T. M. (1991), The early stages of new product development in entrepreneurial hi-tech firms, *Journal of Product Innovation Management,* Vol. 8, No. 1, pp. 37-48.

Pavia, T. M. (1990), Product growth strategies in young high-technology firms, *Journal of Product Innovation Management,* Vol. 8, No. 1, pp. 18-31.

Payne, M. (1993), *Linkages: Effective Networking in Social Care,* Whiting & Birch Ltd, London.

Perry, C. (1990), After Further Sightings of the Heffalump, *Journal of Management Psychology,* Vol. 5, No. 2, pp. 22-31.

Perry, C., Meredith, C. G. and Cunnington, H. H. (1988), Relationships between Small Business Growth and Personal Characteristics of Owner-managers: an Australian Study, *Journal of Small Business Management,* Vol. 26, No. 2, pp.76-79.

Perry, C., Meredith, C. G. and Cunnington, H. H. (1986), Need for Achievement and Locus of Control of Australian Small Business Owner-managers and Super Entrepreneurs,

International Small Business Journal, Vol. 4, No. 4, pp. 55-64.

Perry, C., Macarthur, R., Meredith, C. G. and Cunnington, H. H. (1984), Differences Between Intending and Existing, and Between High-growth and Low-growth Entrepreneurs, *Management Forum,* Vol. 10, No. 3, pp. 147-155.

Perussia, F. (1995), Some cues against the cross-cultural validity of locus of control as a basic personality trait, *Perceptual and Motor Skills,* Vol. 80, pp. 1139-1144.

Pervin, L. A. (1996), *The Science of Personality,* John Wiley, Chichester.

Peterson, R. A. (1981), Entrepreneurship and Organization, In: Nystrom, P. C. & Starbuck, W. H. (Eds), *Handbook of Organizational Design - Volume 1 - Adapting organizations to their environments, pp. 65-83, Oxford University Press, Oxford.*

Phillips, D. C. (1987), *Philosophy, Science, and Social Inquiry,* Oxford University Press: Oxford.

Popper, K. (1976), *Unended Quest,* Open Court: Illinois.

Popper, K. (1959), *The Logic of Scientific Discovery,* Hutchinson: London.

Porter, L. W., Crampon, W. J. & Smith, F. J. (1976), Organizational commitment and managerial turnover, *Organizational Behavior and Human Performance,* Vol. 15, pp. 87-98.

Porter, L. W., Steers, R. M., Mowday, R. T. & Boulian, P. V. (1974), Organizational commitment, job satisfaction, and turnover amongst psychiatric technicians, *Journal of Applied Psychology,* Vol. 59, pp. 603-609.

Porter, M. E. (1980), *Competitive Strategy: Techniques for Analyzing Industries and Competitors,* Free Press, New York.

Porter, M. E. & Millar, V. E., (1985), How Information gives you Competitive Advantage, *Harvard Business Review,* Vol. 85, July-August, pp. 149-160.

Powell, W. P. (1991), Neither market nor hierarchy: network forms of organization, In: G. Thompstone, J. Frances, R. Levacic & J. Mitchell (eds.), *Markets Hierarchies and Networks – The Co-ordination of Social Life,* Open University – Sage Publications, London, pp. 265-276.

Powers, D. E. and Alderman, D. L. (1982), Feedback as an incentive for responding to a mail questionnaire, *Research in Higher Education,* Vol. 17, pp. 207-211.

Precker, J. (1952), Similarity of Valuings as a Factor of Selection of Peers and Near-Authority Figures, *Journal of Abnormal Psychology,* Vol. 47, April Supplement, pp. 406-414.

Pugh, D. S. and Hickson, D. J. (1976a), *Organizational Structure in its Context (vol.1),* Saxon House: Farnborough

Pugh, D. S. and Hickson, D. J. (1976b), *Organizational Structure: Extensions and replications (vol.2),* Saxon House: Farnborough

Putnam, H. (1978), *Meaning and the Moral Sciences,* Routledge and Keegan Paul: London.

Rawdon, V. A., Willis, F. N. and Ficken, E. J. (1995), Locus of control in young adults in Russia and the United States, *Perceptual and Motor Skills,* Vol. 80, pp. 599-604.

Reitz, H. J. and Groff, G. K. (1974), Economic development and belief in locus of control among factory workers in four countries, *Journal of Cross-Cultural Psychology,* Vol. 5, pp. 344-355.

Reynolds, W. M. (1976), Social desirability of achievement motivation, *Psychological Reports,* Vol. 39, No. 3, p. 1182.

Reyuoso, J. F. and Moores, B. (1996), Internal relationships, In: F. Buttle (ed.), *Relationship Marketing: Theory and Practice,* Paul Chapman: London, pp. 55-73.

Ritzer, G. & Trice, H. M. (1969), An Empirical study of Howard Becker's side-bet theory, *Social Forces,* Vol. 47, pp. 475-479.

Robson, I and Rowe, J. (1997), Marketing - the whore of Babylon? *European Journal of Marketing,* Vol. 31, No. 9-10, pp. 654-666.

Robicheaux, R. A. & Coleman, J. E. (1994), The Structure of Marketing Channel Relationships, *Journal of the Academy of Marketing Science,* Vol. 22, No. 1, pp. 38-51.

Robinson, P. B., Huefner, J. C. & Hunt, H. K. (1991), Entrepreneurial research on student subjects does not generalize to real world entrepreneurs, *Journal of Small Business Management,* Vol. 29, No. 2, pp. 42-50.

Rogers, E. M. & Kincaid, D. L. (1981), *Communication Networks: Toward a New Paradigm for Research,* Academic, New York.

Ronstadt, R. and Peterson, R. (1988), *Networking for Success: KnowWho plus KnowHow, Lord, Natick: MA.*

Rosenberg, L. J. and Czepiel, J. A. (1984), A marketing approach to customer retention, *Journal of Consumer Marketing,* Vol. 1, pp. 45-51.

Rotter, J. B. (1975), Some problems and misconceptions related to the construct of internal versus external control of reinforcement, *Journal of Consulting and Clinical Psychology,* Vol. 43, pp. 56-67.

Rotter, J. (1967), A New Scale for the Measurement of Interpersonal Trust, *Journal of Personality,* Vol. 35, December, pp. 651-665.

Rotter, J. B. (1966), Generalized expectancies for internal versus external control of reinforcement, *Psychological Monographs,* Vol. 80, No. 1, pp. 1-28.

Rousseau, J-J. (1976), *The Social Contract,* Penguin, Harmondsworth.

Ruan, D. C. (1993), Interpersonal Networks and Workplace Controls in Urban China, *Australian Journal of Chinese Affairs,* No. 29, pp. 89-105.

Rueveni, U. (1979), *Networking families in crisis: Intervention strategies with families and social networks,* Human Sciences Press, New York.

Runkel, P. J. and McGrath, J. E. (1972), *Research on Human Behavior,* Holt, Rinehart, Winston: New York.

Salancik, G. R. (1995), WANTED: A Good Network Theory of Organizations, *Administrative Science Quarterly,* Vol. 40, pp. 345-349.

Sampson, S. F. (1969), *Crisis in a cloister,* Ph.D. dissertation, Cornel University, Ithaca, New York.

Sanday, P. R. (1979), The Ethnographic Paradigm(s), *Administrative Science Quarterly,* Vol. 24, pp. 527-538.

Sarantakos, S. (1998), *Social Research (2nd Edition),* Macmillan: Basingstoke.

Saxenian, A. (1990), Regional Networks and the Resurgence of Silicon Valley, *Californian Management Review,* Vol. 33, No. 1, pp. 89-112.

Scase, R. & Goffee, R. (1982), *The Entrepreneurial Middle Class,* Croom Helm, London.

Schatzman, L. and Strauss, A. I. (1973), *Field Research,* Prentice-Hall: Englewood Cliffs, NJ.

Schneider, K. C. & Johnson, J. C. (1995), Stimulating Response to Market Surveys of Business Professionals, *Industrial Marketing Management,* Vol. 24, No. 4, pp. 265-276.

Schotter, A. (1990), *Free Market Economics (2nd Ed.),* Basil Blackwell, Oxford.

Schlenker, B. R., Helm, B. & Tedeschi, J. T. (1973), The Effects of Personality and Situational Variables on Behavioral Trust, *Journal of Personality and Social Psychology,* Vol. 25, No. 3, pp. 419-427.

Schneider, J. M. and Parsons, O. A. (1970), Categories on the locus of control scale and cross-cultural comparisons in Denmark and the United States, *Journal of Cross-Cultural Psychology,* Vol. 1, pp. 131-138.

Schurr, P. H. & Ozanne, J. L. (1985), Influence on Exchange Processes: Buyers' Preconceptions of a Seller's Trustworthiness and Bargaining Toughness, *Journal of Consumer Research,* Vol. 11, March, pp. 939-953.

Sechrest, L. (1976), Personality, *Annual Review of Psychology,* Vol. 27, pp. 1-28.

Sexton, D. L. and Bowman, N. B. (1986), Validation of a personality index: Comparison of psychological characteristics of female entrepreneurs, managers, entrepreneurial students, and business students, *Frontiers of Entrepreneurial Research,* Wellesley, Babson Centre for Entrepreneurial Studies.

Sharma, A. and Sheth, J. N. (1997), Supplier relationships: Emerging issues and challenges, *Industrial Marketing and Management,* Vol. 26, No. 2, pp. 91-100.

Shaw, E. (1998a), Networks as a Strategic Entrepreneurial Marketing Tool - A Review of the Evidence, Paper presented to the UIC/AMA (MEIG) Research Symposium on Entrepreneurial Marketing, Chicago, August.

Shaw, E. (1998b), The Real Networks of Small Firms, In: D. Deakins, P. Jennings and C. Mason (eds.), *Small Firms in the Nineties,* Paul Chapman, pp. 7-17.

Sheldon, T. (1994), *Lan Times Encyclopaedia of Networking,* Osbourne McGraw Hill.

Sheth, J. N. (1994), The domain of relationship marketing, Unpublished paper, *Second Research Conference on Relationship Marketing,* Centre for Relationship Marketing, Emory University, Atlanta: GA.

Sieber, S. D. (1976), A Synopsis and Critique of Guidelines for Qualitative Analysis contained in Selected Textbooks, *Project on Social Architecture in Education,* Centre for Policy Research: New York.

Silver, A. D. (1993), *Strategic Partnering: How to join forces with other companies to get: capital, R&D, Marketing, Product testing, Sales support,* McGraw-Hill, London.

Simon, H. A. (1976), *Administrative behavior: A study of decision-making processes in administrative organizations,* Free Press, New York.

Singh, S. (1979), Relationships among projective and directive verbal measures of achievement motivation, *Journal of Personality Assessment,* Vol. 43, No. 1, pp. 45-49.

Skinnner, B. F. (1957), *Verbal behavior,* Macmillan: New York.

Skinnner, B. F. (1953), *Science and human behavior,* Macmillan: New York.

Slevin, D. P. & Covin, J. G., (1990) Juggling Entrepreneurial Style and Organizational Structure - How to Get Your Act Together, *Sloan Management Review,* Winter 1990, pp. 43-53.

Smeltzer, L. R. (1997), The meaning and origin of trust in buyer-supplier relationships, *International Journal of Purchasing and Materials Management,* Vol. 33, No. 1, pp. 40-48.

Smeltzer, L. R. & Fann, G. L. (1989), Gender Differences in External Networks of Small Business Owner / Managers, *Journal of Small Business Management,* Vol. 27, No. 2, pp. 25-32.

Smith, D. V., Lowe, B. G., Lyons, D. H. and Old, W. H. (1963), *The Development Project Committee on Standards for Vendor Evaluation,* National Association of Purchasing Agents, New York.

Smith, H. W. (1975), *Strategies of Social Research,* Prentice-Hall: Englewood Cliffs, NJ.

Smith, I. (1982), Some implications of inward investment through take-over activity, *Northern Economic Review,* Vol. 2, pp. 1-5.

Smith, L. M. (1978), An evolving logic of participant observation, educational ethnography, and other case studies, In: L. Schulman (ed.), *Review of Research in Education,* Peacock Press: Chicago.

Smith, N. C. (1991), The context of doctoral research, In: N. C. Smith and P. Dainty, *The Management Research Handbook,* Routledge: London, pp. 215-226.

Smith, N. R. and Miner, J. B. (1984), Motivational Considerations in the Success of Technologically Innovative Entrepreneurs, *Frontiers of Entrepreneurial Research,* pp. 513-528.

Solomon, G. T. & Winslow, E. K. (1988), Towards a descriptive profile of the Entrepreneur, *Journal of Creative Behaviour,* Vol. 22, No. 3, pp. 130-154.

Sonquist, J. & Koenig, T. (1975), Interlocking directorates in the top U.S. corporations: a graph theory approach, *Insurgent Sociologist,* Vol. 5, pp. 196-229.

Spokane, A. R. & Derby, D. P. (1979), Congruence, personality pattern and satisfaction in college women, *Journal of Vocational Behavior,* Vol. 15, No. 1, pp. 36-42.

Stanworth, M. J. K. & Curran, J. (1973), Management Motivation in the Smaller Business, **Epping, Gower Press.**

Steers, R. M. & Spencer, D. G. (1977), The Role of Achievement Motivation in Job Design, *Journal of Applied Psychology,* Vol. 62, No. 4, pp. 472-479.

Stern, L. W. & Reve, T. (1980), Distribution Channels as Political Economies: A Framework for Comparative Analysis, *Journal of Marketing,* Vol. 44, Summer, pp. 52-64.

Stewart, I. (1990), *Does God Play Dice,* Penguin Books, Harmondsworth.

Stevens, J. M., Beyer, J. M., Trice, H. M. (1978), Assessing personal, role and organizational predictors of managerial commitment, *Academy of Management Journal,* Vol. 21, pp. 380-396.

Stevenson, H. H., Roberts, M. J. & Grousbeck, H. I. (1989), *New Business Ventures and the Entrepreneur,* 3rd ed., Irwin, Homewood: ILL.

Storey, D. J. (1994), *Understanding the Small Business Sector,* Routledge, London.

Storey, D. J. & Johnson, S. (1987), *The job generation and labour market change,* MacMillan, London.

Stump, R. L. and Sriram, V. (1997), Employing information technology in purchasing: Buyer-supplier relationships and the size of the supplier base, *Industrial Marketing Management,* Vol. 26, No. 2, pp/ 127-136.

Taylor, S. J. and Bogdan, R. (1984), *Introduction to Qualitative Research,* Wiley, New York.

Teece, D.J., (1986), Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing and Public Policy, *Research Policy,* Vol.15 pp.285-305

Thompson, C. J., Locander, W. B. and Pollio, H. R. (1989), Putting Consumer Experience Back into Consumer Research: The Philosophy and Method of Existential-Phenomenology, *Journal of Consumer Research,* Vol. 16, pp. 133-146.

Tichy, N. M. (1989), Networks in Organizations, In: P. C. Nystrom and W. H. Starbuck (eds.), *Handbook of Organizational Design Vol. 1,* pp.225-249

Trevillion, S. (1992), *Caring in the community: a networking approach to community partnership,* Longman, Harlow.

Townroe, P. M. & Mallalieu, K. (1991), Infrastructure for Regional Development Advice and Support to New Small Businesses, In: R. W. Vickerman (Ed.), *Infrastructure and Regional Development,* Pion, London, pp. 176-188.

Trevisan, I., Nortje, J., Crous, M. J., Van der Merwe, R. (1994), A Profile of Successful Small Business Entrepreneurs: A Comparative Study, *IntEnt 94,* July 4th-6th.

Tupes, E. C. and Christal, R. E. (1961), Recurrent personality factors based on trait ratings (USAFD Technical Report No. 61-97). U.S. Air Force, Lackland Air Force Base, TX.

Turnbull, P. W. (1979), Roles of personal contacts in industrial export marketing, *Scandinavian Journal of Management,* Vol. 6, pp. 325-337.

Turnbull, P. W. and Valla, J. P. (eds) (1986), *Strategies for International Industrial Marketing,* Croom Helm: London.

Van de Ven, A. H., Hudson, R. and Schroeder, D. M. (1984), Designing New Business Startups: Entrepreneurial, Organizational and Ecological Considerations, *Journal of Management,* Vol. 10, No. 1, pp. 87-107.

Van Maanen, J. (1979), The Fact of Fiction in Organizational Ethnography, *Administrative Science Quarterly,* Vol. 24, pp. 539-550.

Wallach, M. A. and Kogan, N. (1961), Aspects of judgements and decision-making: Interrelationships and changes with age, *Behavioral Science,* Vol. 6, pp. 23-36.

Wallach, M. A. and Kogan, N. (1959), Sex differences and judgement processes, *Journal of Personality,* Vol. 27, pp. 555-564.

Watson, D. and McKee Walker, L. (1996), The Long-Term Stability and Predictive Validity of Trait Measures of Affect, *Journal of Personality and Social Psychology,* Vol. 70, No. 3, pp. 567-577.

Watson, J. B. (1948), Psychology as the Behaviourist Views It, reprinted in W. Dennis (ed.), *Readings in the History of Psychology,* Appleton-Century-Crofts: New York.

Webb, E. and Weick, K. E. (1979), Unobtrusive Measures in Organizational Theory: A reminder, *Administrative Science Quarterly,* Vol. 24, pp. 651-659.

Webster, F. E. & Wind, Y. (1972), *Organizational Buyer Behaviour,* Prentice-Hall, Englewood Cliffs.

Wells, H. G. (1995), *The Time Machine,* J. M. Dent, London.

West, S. G. and Graziano, W. G. (1989), Long-Term Stability and Change in Personality: An Introduction, *Journal of Personality,* Vol. 57, No. 2, pp. 175-193.

White, J. E., Lean, J. Gorton, M. and Chaston, I. (1996a), Overcoming sub-optimal entrepreneurial training and development in Eastern Europe, pp. 113-127, In: P. Rosa, M. G. Scott & H. Klandt (eds.), *Educating Entrepreneurs in Modernising Economies,* Avebury, Aldershot.

White, J. E., Gorton, M. and Chaston, I. (1996b), Facilitating Co-operative Networks of High Technology Small Firms: Problems and Strategies, *Small Business and Enterprise Development,* Vol. 31, No. 1, pp. 34-47.

White, J. E. (1990), Increasing Commitment to Key Objectives within an American Multinational, Unpublished MBA Thesis, *International Management Centre,* Buckingham.

Wiener, Y. (1982), Commitments in organizations: A normative view, *Academy of Management Review,* Vol. 7, pp. 418-428.

Willer, D. and Andersson, B. (eds.) (1981), *Networks and Coercion,* Elsevier: New York.

Williams, M. and May, T. (1996), *Introduction to the Philosophy of Social Research,* UCL Press: London.

Williamson, O. E., (1975), *Markets and Hierarchies: Analysis and Antittrust Implications - A Study in the Economics of Internal Organization,* New York, The Free Press.

Williamson, O. E., (1970), *Corporate Control and Business Behavior,* Engelwood Cliffs, N.J., Prentice-Hall.

Wilson, D. T. and Mummalaneni, V. (1986), Bonding and commitment in buyer-seller relationships: a preliminary conceptualisation, *Industrial Marketing and Purchasing,* Vol. 1, No. 3, pp. 44-58.

Wissema, J. G. & Euser, L., (1991), Successful Innovation through Inter-company Networks, *Long Range Planning,* Vol. 24, No. 6, pp. 33-39.

Wolk, S. & Eliot, J. Information-generated influence as a function of locus-of-control patterns in children, *Child Development,* Vol. 45, No. 4, pp. 928-934.

Woodruff, D. (1993), Chrysler's Neon, *Business Week,* No. 3317, pp. 116-126

Woodworth, R. T. ***et al*** **(1980),** The Entrepreneurial Process and the Role of Accountants, Bankers and Lawyers, unpublished paper, Graduate School of Business - University of Washington; noted in V. H. Vesper (ed.), *New Venture Strategies,* Prentice-Hall, New York.