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Newbery, R

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Entrepreneurial identity formation during the initial entrepreneurial experience: The influence of simulation feedback and existing identity

Dr Robert Newbery^{a1}, Dr Jonathan Lean^{b2}, Dr Jonathan Moizer^{b,*}, Dr Mohamed Haddoud^{b3}

^a Newcastle University Business School, Newcastle University, 5 Barrack Road, Newcastle upon Tyne NE1 4SE, United Kingdom

^b Plymouth Business School, University of Plymouth, Drake Circus, Plymouth PL4 8AA, United Kingdom

ABSTRACT

The impact of a negative initial entrepreneurship experience may inhibit the emergence of an entrepreneurial identity and shut down a subsequent entrepreneurial career. Testing theories of identity development usually involve complex longitudinal studies, but the testing may be facilitated through the use of business simulation gaming. Using a quasi-experimental research design, the paper explores how entrepreneurial micro-identity is formed among business undergraduates during the initial entrepreneurial

* Corresponding author. Tel.: + 44 1752 585635.

E-mail addresses: robert.newbery@newcastle.ac.uk (R. Newbery), jonathan.lean@plymouth.ac.uk (J. Lean), jonathan.moizer@plymouth.ac.uk (J. Moizer), mohamed.haddoud@plymouth.ac.uk (M. Haddoud).

¹ Tel.: + 44 191 2081608.

² Tel.: + 44 1752 585622.

³ Tel.: + 44 1752 584976.

experience. In doing so, the research investigates the impact of cognitive dissonance on the salience of the emerging identity and the influence of key existing identities. The paper accomplishes this using a novel dataset derived from a business simulation game. We argue that the simulation offers a valuable resource to test theories within shortened timescales. The paper contributes to the field by problematizing the initial entrepreneurial experience of undergraduate students and supports the case for using simulation gaming as a method to support theory testing.

Keywords:

Entrepreneurial intent

Entrepreneurial identity

Higher education

Simulation game

Simventure

1. Introduction

A number of researchers have considered the entrepreneurial journey as a means to conceptualize entrepreneurship (Pittaway & Cope, 2007a; Fayolle, 2013; Nabi et al., 2017). Here, the individual moves from early stage awareness and initial experience thorough to the consolidation and development of entrepreneurial skills, mind-set and performance (Di Domenico et al., 2014; Carsrud & Brannback, 2009). A key focus of the early stage is the formation of entrepreneurial identity (Farmer et al., 2011; Murnieks et al., 2014). However, few studies review the development of entrepreneurial identity, an

area that has been described as being 'exceptionally important' to the field of enterprise education (Nabi et al., 2017).

Entrepreneurial identity is just one of many parts that operate within a composite 'super' identity (Burke, 2001). Each particular identity comes with its own behavioral expectations that are defined, or imprinted, through various belief systems. These systems operate at an individual, interpersonal and group level, and entrepreneurial behavior will be a result of past experiences, observed behaviors, or conformity with a social group (Burke, 2003; Sluss & Ashforth, 2007). An individual will generally gain entrepreneurial awareness through observation before actually experiencing entrepreneurial behaviors for themselves.

However, existing research has little to say about the transition from 'observer to doer' (Nabi et al., 2010). Identity Conflict Theory suggests that when previously observed behavior conflicts with that experienced, the resulting discord may jeopardize the formation of the nascent entrepreneurial micro-identity (Shepherd & Haynie, 2009). Therefore, the contribution of this paper is to extend Identity Conflict Theory to explain the impact of the initial entrepreneurial experience on the salience of forming an entrepreneurial identity. Here, we expect that the nature of this experience (whether positive or negative) will exert a corresponding influence on salience.

To understand the impact of the initial entrepreneurial experience on identity formation would typically require an experimental approach and longitudinal data, along with the associated risk of external error and high data collection costs. This paper instead takes a novel approach using a business simulation game to generate an appropriate dataset and hypotheses tests. The paper commences by exploring the scope of the extant

literature pertaining to entrepreneurial identity and experience, followed by a conceptualization of how Identity Conflict Theory may explain the formation of entrepreneurial identity during the initial entrepreneurial experience. Then, the theory is empirically tested using a business simulation game and experimental approach to gather data. The resulting model is then analyzed, and the implications for entrepreneurial identity formation are presented.

2. Conceptualizing entrepreneurial identity and the impact of experience

2.1. Entrepreneurial identity

Identity is an expression of self (Josselson, 1994) and is how individuals define and locate themselves within individual, relational and organizational contexts (Ashforth & Johnson, 2001). It is a psychosocial construct comprised of the internalized behavioral expectations of a role (Sluss & Ashforth, 2007; Cantor & Mischel, 1979). Thus, an entrepreneurial identity may be regarded as when individuals “see and talk of themselves as entrepreneurs” (Down & Reveley, 2004, p. 234). For an entrepreneur, behavioral expectations may relate to how an opportunity is discovered or exploited (Shane, 2010). Entrepreneurial identity may be one of many micro-identities functioning within what has been described as a holistic “super-ordinate” identity (Shepherd & Haynie, 2009). In turn, these groups of behavioral expectations operate within individual, relational and collective social norms that define what constitutes acceptable behavior within society (Burke, 2003), thus providing a basis for individuals to gauge which actions are appropriate within a particular identity (Shepherd & Haynie, 2009).

Society provides numerous templates of the ideal roles and associated behaviors. For example, role models are regarded as critical points of reference for individuals to learn and model observed behaviors. Gender identities are another example, in which males and females have associated behavioral expectations. However, individuals may have numerous identities that they enact contingent upon the setting. Here, a particular identity may be more salient than another, depending on operant social norms.

2.2. The role of entrepreneurial experience in identity formation

An individual typically gains awareness about entrepreneurs through didactic learning and the observation of role models within contexts such as family, peer groups and popular media (Swail et al., 2013). At this early stage, the individual's impression of entrepreneurs is based on an eclectic mix of observed behaviors. The next phase in their journey in becoming an entrepreneur is experiencing these behaviors. Whilst the role of entrepreneurial experience on entrepreneurial intent and subsequent entrepreneurial activity is widely discussed in the literature (Zapkau et al., 2015; Shane & Khurana, 2003), less research has specifically examined its relationship with entrepreneurial identity. Yitshati and Kropp (2016) find that entrepreneurial identity among high-tech and social entrepreneurs is shaped over time through a combination of prior work and personal experiences, including interactions with mentors and business partners. Such experiences may support the sense of passion (Cardon et al., 2009) associated with entrepreneurial identity. Meanwhile, Obschonka et al. (2015) find that prior entrepreneurial experience has a positive effect on entrepreneurial identity and highlighted the occupational socialization effects of entrepreneurial work. They also

identify the mutually reinforcing relationship between behavioral experience and entrepreneurial identity, whereby identity motivates entrepreneurial behavior, which in turn strengthens entrepreneurial identity. Similarly, Farmer et al. (2011) argue that learning gained through prior experience plays an important moderating role that reinforces identity to influence future entrepreneurial activity.

In an educational context, entrepreneurial experience may occur via experiential learning and practice through activities such as venture creation, student consultancy activity and educational simulation (Corbett 2005; Pittaway & Cope, 2007b). Hence, such educational tasks and projects may be considered as proxies for real-life entrepreneurial experience.

2.3. Levels of belief and micro-identity formation

An aspect of entrepreneurial identity formation that is less well understood is how individuals transition from observing to experiencing affects the formation of entrepreneurial identity. What if the observed eclectic behaviors give a false sense of what it means to be an entrepreneur? What if a role model displays one behavior but enacts another? What if the observed behavior is at odds with existing identities? What if it is a bad experience?

In an exploration of the conflict between role identities in family firms, Shepherd and Haynie (2009) developed Identity Conflict Theory. This theory suggested that when there is discord between observed and experienced behaviors, internal behaviors are modified to reduce dissonance. In the context of the family firm, the contradictions were resolved through the development of a family-business meta-identity (Reay, 2009); however, in the

context of a pre-entrepreneurial individual, such dissention may influence, and perhaps jeopardize, the formation of a nascent entrepreneurial identity.

An individual may have a number of different identities, with each one being salient to different behavioral expectations or occupations. The importance of these separate, multiple identities are encapsulated within an over-arching identity and will fluctuate depending upon their salience at any given time (Shepherd & Haynie, 2009). For example, an individual's role-based identity as a manager will be dominant during a business meeting, but a phone call from their child's school will bring their family-based identity as a parent to the fore. These identities may exist side-by-side, forming a composite "super-ordinate" identity.

These micro-identities are not necessarily of equal importance, and in terms of their hierarchy, Sluss and Ashforth (2007) define three cognitive levels that incorporate multiple identities through various belief systems. These include an autonomous and independent individual level, a dyadic or interpersonal level and a collective / group level.

2.3.1. Autonomous and independent individual level of belief

When the observed behaviors of the entrepreneurial identity clash with experienced behaviors, Identity Conflict Theory suggests that internal behaviors will be modified to reduce dissonance and align with identity standards (Hogg et al., 1995). When a clash occurs, the importance of the Entrepreneurial Identity at the autonomous and independent individual level will be reduced. Prior to an intervention, whilst an entrepreneurial identity may be weak, such dissonance will inhibit its further development or emergence. As a consequence, between the transition from an entrepreneurial identity

formed purely through observation to an experience-based entrepreneurial identity, we would expect the salience of entrepreneurial identity to decrease, meaning a reduction in the likelihood of related behaviors and the individual's freely made choice regarding their future actions. We contend that observation and awareness of the behaviors of others may set an unrealistic baseline level entrepreneurial identity, which experience then moderates. Thus, we hypothesize the following.

Hypothesis 1: Cognitive dissonance between observed and experienced entrepreneurial behaviors will lead to a decrease in entrepreneurial identity salience.

2.3.2. Dyadic or interpersonal level of belief

At the dyadic or interpersonal level, according to Role Theory (Merton, 1957), roles are groups of behaviors associated with a defined placement in a social structure, and these roles are anchors in the construction of self (Ebaugh, 1988).

Prior to an entrepreneurial experience, an individual may have an entrepreneurial identity based on observation. Here, they may have been exposed to the behavior of entrepreneurs from whom they have vicariously learned (Vygotsky, 1996). Role models refer to individuals who are seen as a guide by others to 'model' themselves after through socialization (Bandura, 1997; Van Auken et al., 2006). Such people could be parents (Scherer et al., 1989), family, friends, employers (Linan et al., 2011) or people in the public eye (Swail et al., 2013). Entrepreneurial role models have been shown to influence entrepreneurial intentions (Linan et al., 2011). Based on this observational learning, an individual may have begun to internalize behaviors of which they have no direct experience. However, since role models often only communicate their own "edited

highlights,” it is unlikely that observers will be exposed to much of the “everydayness” of entrepreneurship (Steyaert & Katz, 2004). In fact, individuals may receive reflected appraisals that are different from the actual experience (Carr & Sequeira, 2007). Whilst awareness may expose individuals to a sub-set of behaviors, identities are also constructed through exposure to mundane events of daily life. These may relate to unexciting but necessary behaviors that include the operational realities of running a business (Julien, 2007). Arguably, it is only through the experiential phase that the individual starts to internalize the common behaviors of the entrepreneurial process.

Although it is common that people identify themselves with role models and use this as a guide for their behaviors, identity conflicts could arise when the entrepreneurial experience diverges with that of role models. As such, we hypothesize the following.

Hypothesis 2: The presence of an entrepreneurial role model will increase the cognitive dissonance between observed and experienced entrepreneurial behaviors and decrease the salience of an entrepreneurial identity.

2.3.3. Collective or group level of belief

At the collective or group level, identity may be motivated by the welfare of a wider group. According to Social Identity Theory, at this level, interaction is based on group-level characteristics, or prototypes, and not individual attributes (Tajfel & Turner, 1986). These group prototypes in turn influence an individual’s interpersonal identities (Sluss & Ashforth, 2007). One example of a group prototype would be the set of behaviors associated with gender, although class, religion, ethnicity and age group are all potential prototype groups.

Essers and Benschop (2007) describe different paths towards the development of gendered entrepreneurial identity amongst females. They can reject gender-related expectations (that is, be more masculine) or reject a masculine conceptualization of entrepreneurship. Alternatively, they can conform to cultural norms, embracing feminine behaviors. Dependent on whether women challenge or conform to entrepreneurial stereotypes, outcomes may reinforce such stereotypes or increase identity tension (Bjursell & Backvall, 2011).

Entrepreneurship is typically regarded as a male career path (Sánchez Cañizares & Fuentes Garcia, 2010). Consequently, women often represent a minority in the business start-up community (Marlow, 2002), and this is confirmed by their lower levels of entrepreneurial intention (Joensuu et al., 2013). Common barriers expressed by women include fear of failure, lower self-efficacy and a lack of support structures (Shinnar et al., 2012). They may also show less work experience, and have fewer role models (Dyer, 1994) and more limited access to social and human capital (McGowan et al., 2015).

These gender differences seem likely given the research showing that men and women that scored high on male gender identification scales have reported higher entrepreneurial intentions than those with low scores (Gupta et al., 2009). As such, pre-existing female gender-based behaviors may lead to an identity conflict with the androcentric behaviors associated with entrepreneurship. For example, Bönthe & Piegeler (2013) associate the gender gap in nascent entrepreneurship with differences in competitiveness between males and females, whilst Carter et al. (2003) highlight the greater importance of financial success to males. When females are motivated towards entrepreneurialism, their drivers significantly differ (Sullivan & Meek, 2012) and include

factors such as work-family balance and social goals (Berger & Kuckertz, 2016) that are not typically associated with the male-dominated image of entrepreneurship. Therefore, the group-level identity of being a woman might conflict with the individual-level identity of being an entrepreneur and lead to “two conflicting discourses” (Ahl, 2004, p. 61). Hence, we hypothesize the following.

Hypothesis 3: Conflict between female gender-based behaviors and experienced entrepreneurial behaviors will lead to a decrease in the salience of an entrepreneurial identity.

2.4. Performance feedback and interaction with levels of belief

With respect to experience, it is likely that a positive entrepreneurial experience will reinforce the salience of an entrepreneurial identity, whilst a negative experience will reduce it. Feedback is integral to organizations, and this is classically articulated in Agyris and Schön's (1974) single- and double-loop learning processes, where action strategies, consequences and governing variables interplay. Positive or negative performance feedback can govern how one thinks and acts. Chen et al. (1998), in examining the psychology of entrepreneurs, argue that an individual's performance is linked to their self-efficacy through a cycle of mutual reinforcement. Self-efficacy influences performance through a combination of interest, motivation and perseverance, with performance providing feedback information that determines how self-efficacy is further evaluated and modified. Oettingen et al. (2012) specifically identify how positive feedback for individuals can reinforce performance, finding that people receiving positive feedback performed better in problem solving tasks than those receiving moderate feedback. Boyd and

Vozikis (1994) identified positive verbal feedback as influencing the self-efficacy of entrepreneurs. Hence, we hypothesize the following.

Hypothesis 4: Positive performance feedback will reduce dissonance between observed and experienced behaviors and increase the salience of an entrepreneurial identity.

We would expect feedback on the nature of the experience to have a magnifying effect on the impact of the various levels of existing identity and their influence on entrepreneurial identity formation. Although entrepreneurial role models were found to increase individuals' entrepreneurial identity through enhancing their self-efficacies (Laviolette et al., 2012), these models are also likely to create a cognitive gap between observed and experienced behavior. In this regard, it is argued that entrepreneurial role models influence entrepreneurial identity when other successful business opportunities that were identified by others are considered as a reference (Lafuente and Vaillant, 2013). Hence, in accordance with Bandura's (1977) Social Learning Theory, entrepreneurial learning would occur through observations of others rather than direct experience. Consequently, this may result in an expectancy gap between what is observed and experienced. Lafuente and Vaillant's (2013) findings showed that the influence of entrepreneurial role models is positive in pre-start-up entrepreneurial activities, but not in post start-up activities, where individuals have already gained direct experience. Therefore, when there is negative feedback exposure, those individuals' entrepreneurial identities may decrease even further because of a greater expectancy gap. Thus, we hypothesize the following.

Hypothesis 5: In the presence of entrepreneurial role models, negative performance feedback will increase the cognitive dissonance between observed and experienced behavior, resulting in a decrease in entrepreneurial identity salience.

Finally, the influence of performance feedback on entrepreneurial identity can be considered gendered. Research suggests that women often react differently than men to performance feedback. While entrepreneurial success expectancy is often greater amongst male entrepreneurs than their female counterparts, this expectancy was found to be reduced by negative feedback (Gatewood et al., 2002). Here, early evidence suggested that negative feedback could be more pronounced for women than for men (Maccoby and Jacklin, 1974). Amongst the reasons behind this disparity is the gender gap in entrepreneurial self-confidence (Gatewood et al., 2002). In this respect, previous studies indicate that women have less entrepreneurial self-efficacy than men (Nowiński et al., 2017) and that masculine entrepreneurship stereotypes are likely to discourage women's assessments of new entrepreneurial opportunities (Gupta et al., 2014). Consequently, women are more likely to underrate their performance and less likely to take credit for their success (Verheul et al., 2005); thus, we hypothesize the following.

Hypothesis 6: Female gender-based group identity will interact with negative performance feedback to increase the cognitive dissonance between observed and experienced behavior, resulting in a decrease in entrepreneurial identity salience.

Having set out a number of hypotheses relating to individual entrepreneurial identity formation under the influence of existing interpersonal and group-based identities in conditions of an initial entrepreneurial experience, the paper will now discuss the

methodology. Following this, we discuss our findings and the implications for entrepreneurial identity formation.

3. Methodology

This paper adopts a pre-test / post-test quasi-experimental design (as suggested by Martin et al., 2013 and following Soutaris et al., 2007) to explore the impact of the initial entrepreneurial experience on the entrepreneurial identity of a group of early stage undergraduates^b.

Ideally, the methods required to test our hypotheses would incorporate an experimental approach, with pre- and post-test, along with the capture of data as students' trade and performance over an extended period of time (Nabi et al., 2017). However, such an approach increases the chance for measurement error through unknown exogenous factors and is a logistically complex process. To reduce the opportunity for external influences, we instead use a business simulation game to generate an appropriate dataset. This approach has both pedagogic and scientific benefits.

Higher education teachers increasingly use simulation games to offer students an immersive experience of the entrepreneurial process (Pittaway & Cope, 2007b; Usart & Romero, 2014). They can be used to simulate the business creation process (Neck & Greene, 2011). Simulations fit a demand model of teaching located within a subjectivist paradigm, where personal meaning is constructed through experimentation (Nabi et al.,

^b The institutional setting is a UK university and the target audience are business and management undergraduates. First year students at the beginning of their programme were selected. Within this setting, the objectives were pedagogic, e.g. developing a mind-set orientation.

2017). They can provide an effective vehicle for experiencing the complexities and uncertainties of working as an entrepreneur (Newbery et al., 2016) in a safe environment that protects the student from possible negative real-world consequences of their decisions, whilst encouraging reflective learning through iterative game play and debriefing (Moizer et al., 2006; Leemkuil & De Jong, 2012). Then, the lessons learned from simulation gaming be transferred to the real world of work (Allal-Chérif & Makhoulf, 2016). As such, simulation games can create a rich learning environment for students to pre-experience entrepreneurial behaviors. Students are given 'permission to fail', as long as they can reflect on the reasons why they failed (Kapp, 2012), leading to opportunities for generative learning at all phases of the simulation process (Zantow et al., 2005). Whilst business simulation games can help students learn about complex issues, they are not self-teaching. Pando-Garcia et al. (2016) advise that instructors have a role in encouraging student acceptance and engagement with such technologies.

Simulations are increasingly regarded as a viable approach to test theories, offering an alternative scientific approach and allowing for rapid replication of research (Axelrod, 1997). A key criticism of using simulations in such a way is that they are based on specific and simplified rules that may exclude important variables from the testing environment (Abbott, 2001). Conversely, this has also been highlighted as a strength of simulation, where the axioms of theory define the frame of reference and, within this controlled environment of fixed effects, are tested (Garson, 2009). This suggests that such rule-based simulations are unlikely to be appropriate for theory development but are particularly suitable for theory testing.

Here, a fully experimental design would have had groups randomly assigned by the investigators to simulation or non-simulation activities. Given teaching conditions, the groups self-selected, and a distinct control group was independently selected. A pre-test questionnaire was administered to participants at the *entrepreneurial awareness* phase (Linan, 2004; QAA, 2013), and then the entrepreneurial experience was undertaken. Finally, a post-test questionnaire measured changes using the same survey instrument. The control group measured the changes in students not participating in the entrepreneurial experience. Each questionnaire took approximately 5 minutes to complete. Table 1 shows the questions used alongside the summary statistics.

TABLE 1 ABOUT HERE

The study used a measure of entrepreneurial intention (EI) as a proxy for entrepreneurial identity salience. This is based on the observation that an individual has an entrepreneurial identity when they regard themselves as an entrepreneur (Down & Reveley, 2004) and that it is an indicator of personal change (Nabi et al., 2017). Hence, intentions to behave entrepreneurially denote an entrepreneurial identity, with a high intention corresponding to high salience. Linan's (2004) EI scales have been tested under different empirical contexts and may thus be considered robust^c.

FIGURE 1 ABOUT HERE

^c Within this study this is a reliable measure with a Cronbach Alpha of 0.827 pre-test and 0.839 post-test.

As Fig. 1 shows, an individual super-ordinate identity comprises a number of existing micro-identities. According to entrepreneurship theory, the most salient of these to entrepreneurial identity are gender, age, role models and work experience. These should exert an influence on the salience of a nascent entrepreneurial identity based purely on observation. Following an entrepreneurial experience, we expect this salience to change.

We also expect the presence of role models and gender to influence this behavior. A role model is a positive influence on entrepreneurial identity; however, when entrepreneurship is experienced for the first time, it may cause a reassessment. To explain this, we would expect positive performance feedback to reinforce positive role models and negative performance feedback to create identity dissonance, reducing the salience of entrepreneurial identity.

During the experiential phase, the observed entrepreneurial identity is incorporated as an existing identity within the super-ordinate, while entrepreneurial experience is added to the experience category. These influence an experienced entrepreneurial identity. To control for selection-bias, the study was restricted to first year undergraduate students undertaking an introductory business and management course.

Prior to the first session, students were asked to complete the online questionnaire. Then, they managed a virtual start-up company in teams of 4-5 over a simulated trading period of 36 months within a real-world period of 3 weeks. Within the simulation game, at the start of every decision cycle, the students submitted a number of operational level decisions informed by their determination of current performance, with the expressed goal of improving company performance. Following the final decision cycle, the students were emailed a link to the post simulation questionnaire. After filtering out students with

previous entrepreneurial experience, 263 usable paired individual responses to the pre- and post-simulation questionnaires were obtained against a control group of comparable business students (in terms of age, level and program) that did not participate in the simulation. The latter resulted in 48 matched pre / post pairs. Drawn from a population of 1,118, the response rate was 23 percent.

A measure of performance feedback was created, whereby if a profit was made at the end of a decision cycle, a point was added, whilst a loss resulted in a point being subtracted; resulting in a normally distributed measure across the group. This led to a cumulative measure of performance that we argue is of more utility to the research than a simplistic focus on the group's final profit. Here, a student that has experienced negative feedback over every cycle would have a negative score of 36. These are 36 points of experienced feedback that confirm that their entrepreneurial behavior was ineffective.

Age group is a group-level identity that has been considered as a key influence in identity formulation. Different generations may identify more strongly with their own age group (Down & Reveley, 2004). Since age is likely to have an influence on the entrepreneurial process (Reynolds et al., 2002), the latter was included as a control variable in the proposed model; however, given the target group, little variation was expected.

When studying entrepreneurial factors, previous occupational experiences should be considered (Jones-Evans, 1996). Non-entrepreneurial work experience may have an influence on behavior and may moderate entrepreneurial identity formation. Experience was found to be an important factor in shaping attitudes towards entrepreneurship

(Peterman & Kennedy, 2003). Empirical evidence revealed an explained variance of approximately 50-90 percent of venture ideas being generated through work experience (Hills et al., 1999). As such, non-entrepreneurial experience was also controlled for.

4. Analysis

Our sample displayed a median age of 19 years (mean 19.5 years; standard deviation 4.3 years); 42.4 percent of the participants were female, whilst 57.6 percent were male. A total of 60.9 percent of participants encountered an entrepreneurial role model. A paired sample T-test uncovered a significant influence of the simulation upon the Entrepreneurial Intent of the participants, which was significant at the 5 percent level in a paired sample t-test. A total of 32.4 percent of participants showed an increase in intent, 11.2 percent showed no change, and 56.4 percent showed a decrease. However, the control group exhibited no significant effect on EI during the same period.

A logistic regression model was applied to the data to control for the effects of cross correlation and test the likelihood of an increase or decrease in salience of an entrepreneurial identity as a result of the entrepreneurial experience. The log odds of an increase or decrease in salience is predicted by the model. Table 2 describes the model and includes the log odds and standard errors. From the available sample of 263 responses, missing data resulted in 27 deleted cases, or an 11 percent reduction in the sample size. Despite this reduction, the data captured provided sufficient power for analysis to occur.

For all models, the educational level is controlled by the experimental setting. Age has low variability around the median of 19 years and is included for consistency. Model 1

introduces the first-order effects, which, according to Nagelkerke's R^2 (a measure of variance adjusted for sample size explained by the model), explains 6.6 percent of variance. Model 2 introduces the second-order effects that explain 9.0 percent of the variance. Other predictor variables are likely to exist but are not captured in the model.

TABLE 2 ABOUT HERE

Model 1 shows that females are more likely to see a decrease in salience of their entrepreneurial identity as a result of an entrepreneurial experience, and those with an entrepreneurial role model are also more likely to see a decrease. Hence, hypotheses 1, 2 and 3 are accepted. Ignoring interaction effects, performance feedback has no significant relationship, leading to the rejection of hypothesis 4. The second-order model shows that females see a decrease in salience resulting from entrepreneurial experience; however, role model only exerts an influence as an interaction with performance feedback. There was no significant interaction between gender and performance feedback. Hence, hypothesis 5 is accepted and hypothesis 6 is rejected.

5. Discussion

The findings of this paper provide a number of insights into an individual's entrepreneurial identity formation and how this relates to the initial stage of their entrepreneurial journey. Based on conceptualizing observed and experienced behaviors as important stages in the entrepreneurial identity formation process, the study hypothesized that dissonance between these behaviors leads to a decrease in the

salience of entrepreneurial identity. After exposing individuals to an entrepreneurial experience for the first time, significant changes were observed in the salience of entrepreneurial identity. This lends support to the associations conceptualized in Fig. 1 and contributes to the literature in the following ways: first, because of the rigor of the experimental design and the control employed, this shows for the first time how an initial formative entrepreneurial experience can either consolidate or “fracture” a nascent entrepreneurial micro-identity. Interpersonal and group-level identities exert a strong influence on the process. Finally, the positive or negative nature of the experience interacts with these existing micro-identities to reinforce the effect. If performance feedback is positive, salience increases; however, if it is negative, then cognitive dissonance leads to a reduction in salience. Whilst gender interacts with the initial entrepreneurial experience, regardless of positive or negative performance feedback, males tend to see an increase and females a decrease in the salience of their entrepreneurial identity.

An entrepreneurial identity founded on observed behaviors is likely to be one that is based on partial and filtered information. Viewed through the lens of the popular media, the sensational behaviors of celebrity entrepreneurs may be appealing but also provide a distorted picture of day-to-day entrepreneurial behavior (Swail et al., 2013; Staeyart & Katz, 2004). More immediate role models, such as family members, reveal little of their internalized behaviors, providing an incomplete picture, even to those very close to them.

Alternatively, direct experience provides a balanced exposure to the complex entrepreneurial reality. Hence, the potential for dissonance arises, with the partial or even glamorized picture of entrepreneurship viewed through observed behavior contrasting

with the potentially more mundane and complex reality of actual entrepreneurial experience (Julien, 2007). Consequently, the entrepreneurial identity remains unformed or low in salience compared to existing identities, leading to a reduction in the salience of the entrepreneurial identity.

We hypothesized that the existence of an entrepreneurial role model increases the dissonance between observed behaviors and experienced behaviors, consequently decreasing the salience of an entrepreneurial identity. This hypothesis was supported, with those individuals able to identify a role model being more likely to experience a decrease in entrepreneurial identity salience because of the entrepreneurial experience. Conversely, individuals with no such role model were more likely to show an increase in salience. The presence of feedback augments this process such that a role model and a positive experience lead to higher levels of entrepreneurial identity salience, whilst a negative experience leads to lower salience.

When individuals identify role models, they are likely to embody the positive observed behaviors associated with entrepreneurship. That is, they will be *positive* role models and, as such, are unlikely to represent those less attractive aspects of entrepreneurship that people may gain insight into through experienced behavior. Therefore, role models may be considered to set heightened positive expectations of entrepreneurship for those who identify with them. These individuals have a concrete benchmark against which to measure their entrepreneurial identity, namely, a personal measurement framework. Where experienced behavior leads individuals to evaluate themselves unfavorably compared to their role model, or to encounter negative sides of entrepreneurship, dissonance is likely to be magnified. As a result, the impact on entrepreneurial identity is

also significant. Conversely, where they have no existing positive entrepreneurial role model and no clear yardstick against which to compare their actual experience of entrepreneurship, their identity formation is less constrained by observed experience. Hence, there is a greater likelihood of increased entrepreneurial identity salience.

The study also hypothesized that conflict between female gender-based behaviors and experienced entrepreneurial behaviors will lead to a decrease in entrepreneurial identity salience for female students when compared to males. The findings supported this hypothesis, showing a greater decrease in salience amongst females as a result of their experienced behavior through the entrepreneurial experience.

Previous research has argued that entrepreneurial behaviors can be considered male-gendered (Ahl, 2004; Calas et al., 2009). The results from this study suggest that pre-existing gender behaviors may create dissonance with experienced entrepreneurial behaviors that hinder the formation of an entrepreneurial identity. There was no significant interaction effect between gender and performance feedback; hence, the influence of gender and entrepreneurial experience on the salience of entrepreneurial identity is independent of a positive or negative entrepreneurial experience, at least where this is measured by performance success.

This result may reflect a greater emphasis on financial success and higher levels of competitiveness among male nascent entrepreneurs (Carter et al., 2003; Bönke & Piegeler, 2013). Sullivan and Meek (2012) contend that women are motivated towards entrepreneurship by a broader range of factors than men. Performance outcomes may play a less significant role in female entrepreneurial identity formation as their entrepreneurial experience is associated more with concerns such as achieving a work-

family balance (DeMartino & Barbato, 2003). The study findings may also reflect evidence indicating that women are less likely than men to take credit for successful performances, instead attributing outcomes to external factors or simply luck (Verheul et al., 2005).

Whereas interpersonal level feedback may provide a benchmark to which an entrepreneurial identity can be reassessed, within the group-level, the degree of dissonance from the group norm may not be simple to overcome. Here, the experienced behaviors are regarded as not fitting the group expectations of prototypical behaviors. The apparent success of non-group behavior does not stop it from being non-group behavior.

6. Conclusion

This paper explored the impact of the initial entrepreneurial experience on the formation of entrepreneurial micro-identity. By utilizing a robust quasi-experimental pre-test and post-test design with treatment and control groups, we found that the difference between observed and experienced behaviors may lead to a cognitive dissonance that reduces the salience of the emergent entrepreneurial micro-identity. In turn, gender and pre-existing entrepreneurial role models influence this. This effect is magnified in the case of role models by performance feedback.

The findings of the research clearly have important implications for entrepreneurship and enterprise education, since they show that an initial entrepreneurial experience within an educational context may have a negative impact on the salience of the forming an entrepreneurial identity. This finding is magnified for those students with a role model,

which suggests the importance of the initial experience as a foundation for entrepreneurial development. Knowledge of this process means that expectations may be managed by educators. Scholars should embrace the dissonance inherent where observed and experienced entrepreneurial behaviors meet. The alternative would involve presenting an unrealistic experience of entrepreneurship, in which enterprise is expressed through self-made heroic entrepreneurs and successful independent businesses (Wright, 2015); hence, sacrificing verisimilitude and perpetuating false images of entrepreneurship may result from purely observed behaviors.

By using a novel longitudinal data-set derived from a business simulation, the research has also provided evidence for the veracity of using simulation data to test entrepreneurial theory. Whilst such an approach has been historically championed (Lant & Mezias, 1990; Gaglio, 2004), there is little evidence of its uptake. We hope this paper supports an increase in the use of simulation as a method to advance the entrepreneurship field.

With respect to limitations, evidence suggests that effects of entrepreneurial activity on performance vary by sector (Carey & Matlay, 2010), and the entrepreneurial experience shared in this research is a simulation set in the context of a small manufacturing company. The use of simulation and its sector orientation introduce variation. As such, further research should be conducted to establish whether similar results are found during the early stage when using other types of experiential learning intervention, such as venture creation and student consultancy activity.

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References

- Abbott, A. (2001). *Time matters: on theory and method*. Chicago: University of Chicago Press.
- Ahl, H. (2004). *The scientific reproduction of gender inequality: A discourse analysis of research texts on womens' entrepreneurship*. Copenhagen: Copenhagen Business School Press.
- Argyris, C., & Schön, D. A. (1974). *Theory in practice: Increasing professional effectiveness*. Oxford: Jossey-Bass.
- Allal-Chérif, O., & Makhlouf, M. (2016). Using serious games to manage knowledge: The SECI model perspective. *Journal of Business Research*, 69(5), 1539-1543.
- Ashforth, B. E., & Johnson, S. A. (2001). Which hat to wear. In M. A. Hogg, & D. J. Terry (Eds.), *Social identity processes in organizational contexts* (pp. 32-48). Philadelphia, PA: Psychology Press.
- Axelrod R. (1997). Advancing the art of simulation in the social sciences. In R. Conte, R. Hegselmann, & P. Terna (Eds.), *Simulating social phenomena* (pp. 21-40). Berlin Heidelberg, DE: Springer.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.

- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman and Co.
- Berger, E. S., & Kuckertz, A. (2016). Female entrepreneurship in startup ecosystems worldwide. *Journal of Business Research*, 69, 5163-5168.
- Bjursell, C., & Bäckvall, L. (2011). Family businesswomen in media discourse: The business role and the mother role. *Journal of Family Business Management*, 1(2), 154-173.
- Bönte, W., & Piegeler M. (2013). Gender gap in latent and nascent entrepreneurship: Driven by competitiveness. *Small Business Economics*, 41, 961-987.
- Boyd, N. G., & Vozikis, G. S. (1994). The Influence of self-efficacy on the development of entrepreneurial intentions and actions. *Entrepreneurship, Theory and Practice*, 18, 63-63.
- Burke, P. (2001), *Relationships among multiple identities. The Future of Identity Theory and Research: A Guide for a New Century Conference*, Bloomington, Indiana.
- Burke, P. (2003). Relationships among multiple identities. In P. Burke, T. Owens, R. Serpe & P. A. Thoits (Eds.), *Advances in Identity Theory and Research* (pp. 195-214). New York: Kluwer Academic/Plenum.
- Calas, M., Smircich, L., & Bourne, K. (2009). Extending the boundaries: Reframing 'entrepreneurship as social change' through feminist perspectives'. *Academy of Management Review*, 34(3), 552-569.
- Cantor, N., & Mischel, W. (1979). Traits as prototypes: Effects on recognition memory. *Journal of Personality and Social Psychology*, 35, 38-44.

- Cardon, M. S., Wincent, J., Singh, J. & Drnovsek, M. (2009), The Nature and Experience of Entrepreneurial Passion, *Academy of Management Review*, 34, 511–532.
- Carey, C., & Matlay, H. (2010). Creative disciplines education: A model for assessing ideas in entrepreneurship education? *Education + Training*, 52, 694-709.
- Carr, J. C., & Sequeira, J. M. (2007). Prior family business exposure as intergenerational influence and entrepreneurial intent: A theory of planned behavior approach. *Journal of Business Research*, 60, 1090-1098.
- Carsrud, A. L., & Brannback, M. (2009). Understanding the entrepreneurial mind. New York: Springer.
- Carter, N. M., Gartner, W. B., Shaver, K. G. & Gatewood, E. J. (2003). The career reasons of nascent entrepreneurs. *Journal of Business Venturing*, 18(1), 13-39.
- Chen, C. C., Greene P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing*, 13(4), 295-316.
- Corbett, A. (2005). Experiential learning within the process of opportunity identification and exploitation. *Entrepreneurship, Theory and Practice*, 29(4), 473-491.
- DeMartino, R., & Barbato, R. (2003). Differences between women and men MBA entrepreneurs: Exploring family flexibility and wealth creation as career motivators. *Journal of Business Venturing*, 18(6), 815-832.
- Di Domenico, M., Elizabeth D., & Daniel N. (2014). 'Mental mobility' in the digital age: entrepreneurs and the online home-based business. *New Technology, Work and Employment*, 29(3), 266-281.

- Down, S., & Reveley, J. (2004). Generational encounters and the social formation of entrepreneurial identity: 'Young guns' and 'old farts'. *Organization*, 11, 233-250.
- Dyer, G. (1994). Toward a theory of entrepreneurial careers. *Entrepreneurship, Theory and Practice*, 19, 7-21.
- Ebaugh, H. R. F. (1988). *Becoming an ex: The process of role exit*. Chicago, IL: University of Chicago Press.
- Essers, C., & Benschop, Y. (2007). Enterprising Identities: Female entrepreneurs of Moroccan and Turkish origin in the Netherlands. *Organization Studies*, 28(1), 49-69.
- Farmer, S. M., Yao, X., & Kung-Mcintyre, K. (2011). The behavioral impact of entrepreneur identity aspiration and prior entrepreneurial experience. *Entrepreneurship, Theory and Practice*, 35(2), 245-273.
- Fayolle, A. (2013). Personal views on the future of entrepreneurship education. *Entrepreneurship & Regional Development: An International Journal*, 25:(7-8), 692-701.
- Gaglio, C. (2004). The role of mental simulations and counterfactual thinking in the opportunity identification process. *Entrepreneurship Theory and Practice*, 28(6), 533-552.
- Garson G. D. (2009). Computerized simulation in the social sciences a survey and evaluation. *Simulation & Gaming*, 40(2), 267-79.
- Gatewood, E. J., Shaver, K. G., Powers, J. B., & Gartner, W. B. (2002). Entrepreneurial expectancy, task effort, and performance. *Entrepreneurship theory and practice*, 27(2), 187-206.

- Gupta, V., Turban D., Wasti S., & Sikdar, A. (2009). The role of gender stereotypes in perceptions of entrepreneurs and intentions to become an entrepreneur. *Entrepreneurship, Theory and Practice*, 33(2), 397-417.
- Gupta, V. K., Goktan, A. B., & Gunay, G. (2014). Gender differences in evaluation of new business opportunity: A stereotype threat perspective. *Journal of Business Venturing*, 29(2), 273-288.
- Hills, G. E., Shrader R., & Lumpkin, G. T. (1999). Opportunity recognition as a creative process. In P. D. Reynolds, W. D. Bygrave, S. Manigart, C. M. Mason, G. D. Meyer, H. J. Sapienza & K. G. Shaver (Eds), *Frontiers of entrepreneurship research* (pp. 216-224). Babson Park, MA: Babson College Press.
- Hogg, M., Terry, D., & White, K. (1995). A tale of two theories: A critical comparison of identity theory with social identity theory. *Social Psychology Quarterly*, 58(4), 255-269.
- Joensuu, S., Viljamaa, A., Varamäki E., & Tornikoski, E. (2013). Development of entrepreneurial intention in higher education and the effect of gender: A latent growth curve analysis. *Education + Training*, 55(8/9), 781-803.
- Jones-Evans, D. (1996). Experience and entrepreneurship: Technology-based owner-managers in the UK. *New Technology, Work and Employment*, 11(1), 39-54.
- Josselson, R. (1994). Identity and relatedness in the life cycle. In H. Bosma, T. Graafsman, H. Grotevant, & D. de Lecota (Eds), *Identity and development: An interdisciplinary approach* (pp. 81-102). Thousand Oaks, CA: Sage.
- Julien, P. (2007). *A theory of local entrepreneurship in the knowledge economy*. MA: Edward Elgar.

- Kapp, K. M. (2012). *The gamification of learning and instruction*. San Francisco: Wiley.
- Lafuente, E. M., & Vaillant, Y. (2013). Age driven influence of role-models on entrepreneurship in a transition economy. *Journal of Small Business and Enterprise Development*, 20(1), 181-203.
- Lant, T. K., & Mezias, S. J. (1990). Managing discontinuous change: A simulation study of organizational learning and entrepreneurship. *Strategic Management Journal*, 11(5), 147-179.
- Laviolette, E.M., Miruna Radu, M, & L.O Brunel, (2012). The impact of story bound entrepreneurial role models on self-efficacy and entrepreneurial intention. *International Journal of Entrepreneurial Behavior & Research*, 18 (6), 720 - 742.
- Leemkuil, H., & De Jong, T. O. N. (2012). Adaptive advice in learning with a computer-based knowledge management simulation game. *Academy of Management Learning & Education*, 11(4), 653-665.
- Linan, F. (2004). Intention-based models of entrepreneurship education. *Piccola Impresa/Small Business*, 3(1), 11-35.
- Linan, F., Urbano, D., & Guerrero, M. (2011). Regional variations in entrepreneurial cognitions: Start-up intentions of university students in Spain. *Entrepreneurship & Regional Development*, 23(3/4), 187-215.
- Maccoby, E. E. & Jacklin, C. N. (1974). *The psychology of sex differences*. Stanford, CA: Stanford Press.
- Marlow, S. (2002). Women and self-employment: A part of or apart from theoretical construct? *International Journal of Entrepreneurship and Innovation*, 3(2), 83-91.

- Martin, B., McNally, J., & Kay, M. (2013). Examining the formation of human capital in entrepreneurship: A meta-analysis of entrepreneurship education outcomes. *Journal of Business Venturing*, 28, 211-224.
- McGowan, P., Cooper S., Durkin, M. & O'Kane, C. (2015). The influence of social and human capital in developing young women as entrepreneurial business leaders. *Journal of Small Business Management*, 53(3), 645-661.
- Merton, R. K. (1957). The role-set: Problems in sociological theory. *The British Journal of Sociology*, 8(2), 106-120.
- Moizer, J., Lean, J., Towler, M., & Smith G. (2006). Modes of learning in the use of a computer-based business simulation game. *International Journal of Learning Technology*, 2, 49-61.
- Murnieks, C. Y., Mosakowski, E., & Cardonssa M. S. (2014). Pathways of passion: Identity centrality, passion, and behavior among entrepreneurs. *Journal of Management*, 40(6), 1583-1606.
- Nabi, G., Holden, R., & Walmsley, A. (2010). Entrepreneurial intentions among students: towards a re-focused research agenda. *Journal of Small Business and Enterprise Development*, 17(4), 537-551.
- Nabi, G., Liñán, F., Krueger, N., Fayolle, A., & Walmsley, A. (2017). The impact of entrepreneurship education in higher education: A systematic review and research agenda. *Academy of Management Learning & Education*, June 2017 16:2 277-299; published ahead of print March 10, 2016, doi: 10.5465/amle.2015.0026.

- Neck, H. M., & Greene P. G. (2011). Entrepreneurship education: Known worlds and new frontiers. *Journal of Small Business Management*, 49(1), 55-70.
- Newbery, R, J. Lean, & Moizer, J. (2016). Evaluating the impact of serious games: The effect of gaming on entrepreneurial intent. *Information Technology & People*, 29(4), 733-749.
- Nowiński, W., Haddoud, M. Y., Lančarič, D., Egerová, D. and Czeglédi, C. (2017). The impact of entrepreneurship education, entrepreneurial self-efficacy and gender on entrepreneurial intentions of university students in the Visegrad countries. *Studies in Higher Education*, pp.1-19; published ahead of print August 21, 2017, doi:10.1080/03075079.2017.1365359.
- Obschonka, M., Silbereisen, R., Cantner, U. & Goethner, M (2015) Entrepreneurial Self-Identity: Predictors and Effects Within the Theory of Planned Behavior Framework, *Journal of Business & Psychology*, 30 (4), 773-794.
- Oettingen, G., Marquardt, M. K., & Gollwitzer, P. M. (2012). Mental contrasting turns positive feedback on creative potential into successful performance. *Journal of Experimental Social Psychology*, 48(5), 990-996.
- Pando-Garcia, J., Periañez-Cañadillas, I., & Charterina, J. (2016). Business simulation games with and without supervision: An analysis based on the TAM model. *Journal of Business Research*, 69(5), 1731-1736.
- Peterman, N., & Kennedy, J. (2003). Enterprise education: Influencing students' perceptions of entrepreneurship. *Entrepreneurship, Theory and Practice*, 28(2), 129-135.

- Pittaway, L., & Cope J. (2007a). Entrepreneurship education: A systematic review of the evidence. *International Small Business Journal*, 25(5), 479-510.
- Pittaway, L., & Cope J. (2007b). Simulating entrepreneurial learning: Integrating experiential and collaborative approaches to learning. *Management Learning*, 38(2), 211-233.
- Quality Assurance Agency (QAA) 2013. *Enterprise and entrepreneurship education: Guidance for UK higher education providers*. Quality Assurance Agency for Higher Education Report, QAA 48809/2012.
- Reay, T. 2009. Family-Business Meta-Identity, Institutional Pressures, and Ability to Respond to Entrepreneurial Opportunities, *Entrepreneurship Theory and Practice*, 33(6), 1265-1270
- Reynolds, P., Carter, N., Gartner, W., Greene, P., & Cox, L. (2002). *The entrepreneur next door, characteristics of individuals starting companies in America*. Kansas City, MO: Ewing Marion Kauffman Foundation.
- Sánchez Cañizares, S., & Fuentes García, F. (2010). Gender Differences in Entrepreneurial Attitudes. *Equality, Diversity and Inclusion: An International Journal*, 29(8), 766-786.
- Scherer, F., Adams, J., Carley, S., & Wiebe, F. (1989). Role model performance effects on development of entrepreneurial career preference. *Entrepreneurship Theory and Practice*, 13(3), 53-71.
- Shane, S. (2010). Reflections on the 2010 AMR Decade Award: Delivering on the promise of entrepreneurship as a field of research. *Academy of Management Review*, 37(1), 10-20.

- Shane, S. & Khurana, R. (2003) Bringing individuals back in: the effects of career experience on new firm founding, *Industrial and Corporate Change*, 12 (3), 519–543.
- Shepherd, D., & Haynie, M. (2009). Family business, identity conflict, and an expedited entrepreneurial process: A process of resolving identity conflict. *Entrepreneurship Theory and Practice*, 33(6), 1248-1264.
- Shinnar, R., Giacomini O., & Janssen F. (2012). Entrepreneurial perceptions and intentions: The role of gender and culture. *Entrepreneurship Theory and Practice*, 36(3), 465-493.
- Sluss, D.M. and Ashforth, B.E. (2007). Relational identity and identification: Defining ourselves through work relationships. *Academy of Management Review*, 32(1), 9-32.
- Souitaris, V., Zerbinati, S., & Al-Laham, A. (2007). Do entrepreneurship programmes raise entrepreneurial intention of science and engineering students? The effect of learning, inspiration and resources. *Journal of Business Venturing*, 22, 566-591.
- Steyaert, C., & Katz, J. (2004). Reclaiming the space of entrepreneurship in society: Geographical, discursive and social dimensions. *Entrepreneurship & Regional Development*, 16(3), 179-196.
- Sullivan, D.M. and Meek, W.R. (2012). Gender and entrepreneurship: a review and process model. *Journal of Managerial Psychology*, 27(5), 428-458.
- Swail, J., Down, S., & Kautonen, T. (2013). Examining the effect of 'entre-tainment' as a cultural influence on entrepreneurial intentions. *International Small Business Journal*, 32(8): 859-875.

- Tajfel, H. and Turner, J. C. (1986). The social identity theory of inter-group behavior. In S. Worchel and L. W. Austin (eds.), *Psychology of Intergroup Relations*. Chicago: Nelson-Hall.
- Usart, M., & Romero, M. (2014). Entrepreneurship competence assessment through a game based learning MOOC. *Games and Learning Alliance Lecture Notes in Computer Science 2014*, 252-264.
- Van Auken, H., Stephens, P., Fry, F., & Silva, J. (2006). Role model influences on entrepreneurial intentions: A comparison between USA and Mexico. *International Entrepreneurship and Management Journal*, 2(3), 325-336.
- Verheul, I., Uhlaner, L., & Thurik, R. (2005). Business accomplishments, gender and entrepreneurial self-image. *Journal of Business Venturing*, 20, 483-518.
- Vygotsky, L. (1996). *Thought and language*. Cambridge, MA: MIT Press.
- Wright, A. (2015). It's all about games: Enterprise and entrepreneurialism in digital games. *New Technology, Work and Employment*, 30(1), 32-46.
- Yitshaki, R. & Kropp, F. (2016) Entrepreneurial passions and identities in different contexts: a comparison between high-tech and social entrepreneurs, *Entrepreneurship & Regional Development*, 28(3-4), 206-233.
- Zantow, K., Knowlton, D. S., & Sharp, D. C. (2005). More than fun and games: Reconsidering the virtues of strategic management simulations. *Academy of Management Learning & Education*, 4(4), 451-458.
- Zapkau, F.B., Schwens, C., Steinmetz, H. & Kabst, R. (2015) Disentangling the effect of prior entrepreneurial exposure on entrepreneurial intention, *Journal of Business Research*, 68(3), 639-653.

Author Biographies

Dr. Robert Newbery is a Senior Lecturer in Enterprise and Innovation at Newcastle University Business School and leads the Entrepreneurship Research Group as part of the University's KITE institute. With a background as an engineer and rural entrepreneur, he has experience in evaluating and supporting initiatives ranging from the world's largest business plan competition (YouWin!) for DfiD to the award-winning ICURE program for the SETSquared partnership. His PhD explored the role and performance of local business associations and he is currently running an innovative rural supply chain micro-franchise scale-up project in Kenya for Comic Relief. His current research relates to entrepreneurship and farmers in the developing and developed context; evaluating and measuring the impact of entrepreneurship initiatives; and critical approaches to entrepreneurship ecosystems.

Dr. Jonathan Lean is an Associate Professor of Strategic Management in the Faculty of Business at Plymouth University. His research interests include simulations for management learning; enterprise education; entrepreneurial learning and development; and small business and enterprise support policy. He is an Associate Editor for the International Journal of Management Education and a Fellow of Enterprise Educators UK, the UK's national networks for entrepreneurship educators.

Dr. Jonathan Moizer is an Associate Professor in Business Operations and Strategy at the University of Plymouth and a Fellow of the Higher Education Academy in the UK. His research interests include both simulation gaming and its applications in education and training, as well as simulation modeling for learning, insight and prediction.

Jonathan is widely published in these fields. He is the current President of the UK Chapter of the System Dynamics Society and sits on the committee of the European Conference on Games Based Learning.

Dr. Mohamed Haddoud is a Lecturer in International Business Management at the University of Plymouth and a Fellow of the Higher Education Academy. His research interests include entrepreneurship education and behavior, international entrepreneurship and fuzzy-set analysis. Mohamed has published articles in the Journal of Enterprise and Small Business Development, Strategic Change Journal and the International Journal of Innovation Management. He currently acts as a Chair of the International Entrepreneurship track in the Institute of Small Business and Entrepreneurship.

Fig. 1. Early stage entrepreneurial identity formation and entrepreneurial intent.

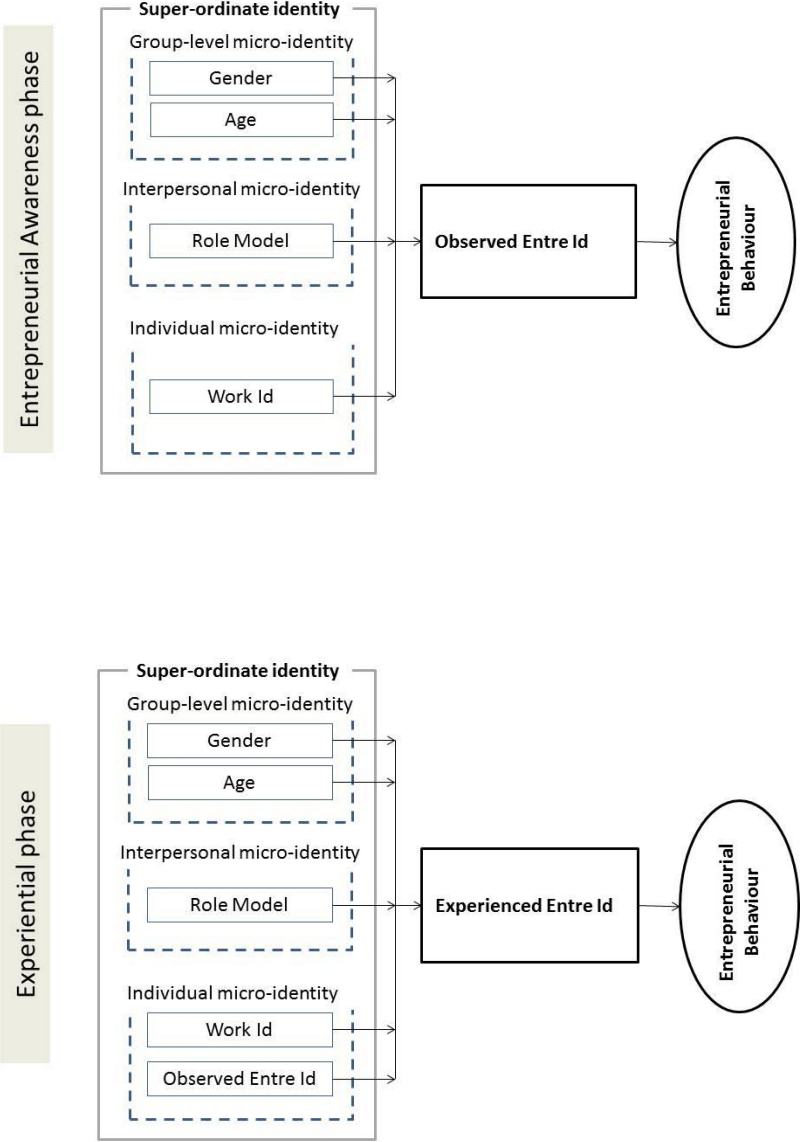


Table 1

Model variables, derivation and summary statistics.

Variable	Derivation (<i>Q</i> = <i>Questionnaire</i> ; <i>SD</i> = <i>Simulation Data</i>)	Mean	St Dev
EI (pre)	Q: Linan (2004) 4 item construct using Likert 7-scale	4.46 / 7	1.19
EI (post)		4.28 / 7	1.18
Age	Q: What is your age?	19.47	4.3
Performance Feedback	SD: Cumulative feedback score	14.10	5.51
Gender	Q: What is your gender?	42% female	58% male
Role Model	Q: Do you know an entrepreneur or entrepreneurs?	61% yes	39% no
Work Experience	Q: Do you have any work experience?	76% yes	23% no

Table 2

Logistic regression predicting an increase or decrease in entrepreneurial identity.

	Model 1		Model 2	
	Log odds	Standard error	Log odds	Standard error
<i>Characteristics</i>				
Education	-	-	-	-
Age	1.004	.037	1.005	.038
Gender	1.877**	.285	1.821**	.288
Role Model	.573**	.285	2.458	.776
Work Experience	.718	.333	.723	.336
<i>Experimental Factors</i>				
Performance Feedback	1.011	.025	1.072*	.040
<i>Interactions</i>				
Perf. Feedback X Role	-	-	.901**	.051
Model				
Constant	.753	.864	.330	.982
Nagelkerke R ²	R ² = .066		R ² = .090	
-2 Log-likelihood	296.790		292.495	
Sample Size N = 263	237		237	

*p < .1 **p < .05