2021

WRAP YOUR AD AROUND MEDIA MULTITASKING: UNDERSTANDING THE FACTORS THAT INHIBIT AND AMPLIFY ADVERTISING EFFECTIVENESS WHILE MEDIA MULTITASKING

Bhaskar, Shikhar

http://hdl.handle.net/10026.1/17784

http://dx.doi.org/10.24382/611
University of Plymouth

WRAP YOUR AD AROUND MEDIA MULTITASKING:
UNDERSTANDING THE FACTORS THAT INHIBIT AND AMPLIFY ADVERTISING EFFECTIVENESS WHILE MEDIA MULTITASKING

by

SHIKHAR BHASKAR

A thesis submitted to the University of Plymouth in partial fulfilment for the degree of

DOCTOR OF PHILOSOPHY

Plymouth Business School

July 2021

Copyright Statement

Declaration

At no time during the registration for the degree of Doctor of Philosophy has the author been registered for any other University award without prior agreement of the Doctoral College Sub-Committee.

Work submitted for this research degree at the University of Plymouth has not formed part of any other degree either at the University of Plymouth or at any other establishment.

This study was financed with the aid of a studentship from Plymouth Business School.

Word Count of main body of thesis: 76,122

Signed:

Date: 23 July 2021

Wrap your Ad around Media Multitasking:

Understanding the factors that inhibit and amplify advertising effectiveness while media multitasking

Dedicated to my daughter Meher

"You can do several things at once, but only if they are easy and undemanding."

-**Daniel Kahneman**,

Thinking, Fast and Slow, 2011: p 19

ACKNOWLEDGEMENT

First and foremost, I would like to thank the University of Plymouth for awarding me the scholarship to pursue this research. I would like to express my sincere thanks to my supervisor Prof Phil Megicks for providing me with the support and guidance in the first few years of my PhD. I would also like to thank my Director of Studies, Dr John White for his valuable suggestions and detailed feedback. I cannot thank enough my supervisor Dr Rob Angell who took me under his wings during my Masters in Cardiff and then helped me in preparing for PhD application. Despite being far from Plymouth, he gave me complete attention and left no stone unturned to direct my research forward. He has not only supervised my thesis but has been supervising my life events since 2015.

I am also grateful to my parents Prof D.R. Bhaskar and Indra Bhaskar, who believed in me and trusted me with their hard-earned money to study in the UK. Thank you, Papa and Ma for your unconditional love and support. I am also thankful to my sisters Deepti and Divya for their constant encouragement from two different parts of the world.

Last but not least, I would like to thank my wife Munira for her motivation and constant belief in me. I would not have been able to accomplish it without her. Thank you for being my strength.

ABSTRACT

This thesis presents that not all media multitasking is detrimental to the advertising messages, by identifying situations when advertising can have a positive effect on the advertising outcomes. The contemporary research in media multitasking posits that media multitasking results in poor memory and higher evaluation of advertisements while media multitasking; however, there are contexts when the memory of advertisements is higher while media multitasking. Building on these contexts, this thesis presents three different experiments to test the effect of media multitasking on advertising memory and attitude. In the first study, the past literature is tested by comparing single-tasking with media multitasking on its effect on brand memory and brand attitude. It also compares the varied cognitive load of media multitasking in their effect on memory and attitude. In the second study, the difficulty experienced during media multitasking's role is explored. The mediating role of difficulty in the effect of media multitasking on advertising memory is tested. Physical and cognitive type of difficulty and their effect on advertising memory is also tested. In the third study, the role of processing ease of processing fluency in explaining the effect of synced advertising on brand memory and brand attitude is tested. The moderating role of privacy concern and attractiveness of endorsers is also tested on the positive effect of processing fluency on advertising outcomes. The results of this thesis establish that cognitive difficulty is detrimental to media multitasking, whereas physical difficulty does not have an adverse effect. Similarly, cognitive ease or processing fluency facilitates the positive effect of media multitasking on advertising outcomes.

Table of Contents

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Ad	Advertisement
MMT	Media Multitasking
CAM	Capacity Model of Attention
LCM	Limited Capacity Model
ELM	Elaboration Likelihood Model
MRP	Multiple Resource Theory
LMMT	Low Media Multitasking
HMMT	High Media Multitasking
PDMT	Physically Difficult Media Multitasking
CDMT	Cognitively Difficult Media Multitasking
Sync	Synchronised
NSMC	Non-Sync Media Condition
SMC	Sync Media Condition

CHAPTER 1: INTRODUCTION

1.1 Overview

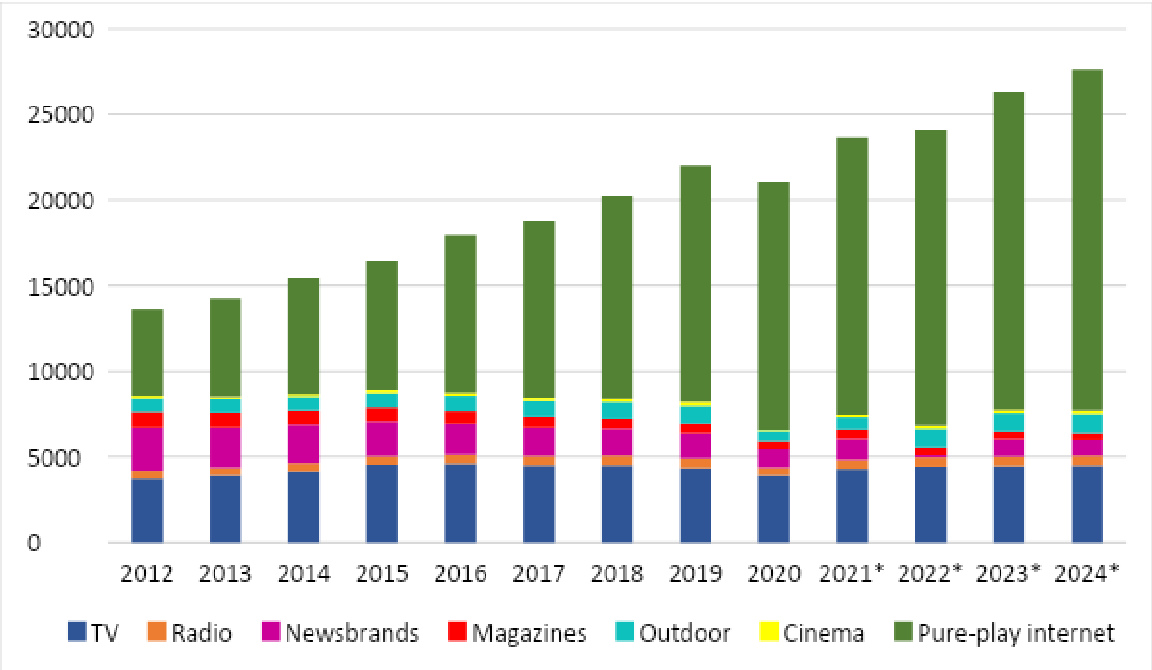
The aim of this chapter is to introduce the reader to the topic of my research and my reasons for pursuing this research. The motivation for this research and some existing gaps in advertising and marketing literature has facilitated the development of the research questions addressed in this research. The focus of this research is to identify the positive impact of media multitasking on advertising effectiveness – which is to see how the use of two or more media devices by individuals at the same time can create opportunities for advertisers to communicate their advertising message effectively.

1.2 Research Area and Research Motivation

The present study was initially motivated by the growth of spending on advertising in the past decade, which was at the rate of 5.7% in 2016, primarily due to an increase in digital advertising spending (Handley, 2016). At the same time, there was another phenomenon that was becoming increasingly prevalent in people's daily lives, i.e. media multitasking (Nielsen, 2018). Media multitasking is the consumption of two or more media at the same time (Duff and Sar, 2015). People were consuming content from two devices at the same time, and the visual attention of individuals was being divided between the devices. Attention is a major resource that is required to process advertising information from the media, and scholars believe that lack of attending leads to poor advertising outcomes (Lord and Burnkrant, 1993; Moore et al., 2005; Segijn et al., 2016). The media multitasking phenomenon has become more popular and in spite of its negative effect on advertising effects there has been no decline in advertising spending (Guttmann, 2021; See figure 1.1).

Advertising spending gradually increased until 2020, with higher growth in digital advertising and subtle growth in traditional advertising except for magazines and direct mail (Guttmann, 2021). In 2020 the world was hit by the global pandemic Covid-19, which impacted the advertising investment for almost all product categories and resulted in a fall in traditional advertising spending and mild growth in digital advertising spending (WARC data, 2020). Only digital advertising such as social media advertising and paid search advertising experienced positive growth (Statistical Research Department, 2021). Although this may be the current situation, the trends project a steady growth from 2021, which will bring the advertising spending in the United Kingdom higher than in 2019 (Guttmann, 2021). The advertising spending is likely to be £24 billion in 2021 and is expected to reach more than £26 billion in 2024 across all formats (Guttmann, 2021). Figure 1.1 presents the advertising spending in the UK by medium.

Figure 1.1: Net advertising spending in the United Kingdom (UK) from 2012 to 2024, by medium (in million GBP)



People are spending more time-consuming media either one at a time or alongside another media. Adults in the United Kingdom spend an average of six hours and 25 minutes on their phones, televisions and laptops each day, which makes a total of almost 45 hours of screen time each week (Wood, 2020). Most of the previous studies in advertising understood the effects of advertising when individuals are exposed to one advertisement at a given time. The processing of advertising messages on a particular media while exposed to another media at the same time was rarely tested. This was because media consumption was mostly one at a time, but now as media consumption behaviour is changing, it is more important than ever to study advertising effects. Although there is a growing trend in understanding media multitasking behaviour and its effect on advertising outcomes (Jeong and Hwang, 2016; Duff and Sar, 2015, Voorveld and Vishwanathan, 2015), there are still some unanswered questions.

The majority of the studies that explored the effect of media multitasking on advertising concluded that it is detrimental for advertising as it leads to poor memory of advertisements (Voorveld, 2011, Duff and Sar, 2015). However, there were few studies that suggested that not all media multitasking is bad. Angell et al. (2016) and Segijn et al. (2017) identified that brand recognition of advertisements could be higher during media multitasking when tasks are related. Duff and Sar (2015) reported that a particular processing style (holistic rather than analytical) enables better memory of advertisements. The above-mentioned studies motivated this research to explore further opportunities which are not detrimental to advertising efforts while media multitasking. It is essential to realise that overall advertising expenditure is increasing and moreover, the spending on digital advertisements is now more than traditional advertising because people are spending more time online than offline (Sentance, 2020). Advertisers should not splurge their marketing budget by placing advertisements on every media in the hope of gaining the attention of their target audience on one of the media. Rather, they should look for creative opportunities by developing detailed and well-planned campaigns that have a maximum effect while media multitasking. Thus, there is a need for academic research to aid advertisers in identifying opportunities for developing effective advertisements for the distracted and inattentive audience engrossed in media multitasking.

1.3 Research Gaps

The extant literature on media multitasking and its effect on information processing and advertising effectiveness has informed this study. However, there are a few gaps in the previous media multitasking research, which in addition to the suggested future direction of research have motivated this research to empirically investigate the impact of media multitasking on advertising effectiveness and explore the underlying reasons for those effects.

Prior studies on media multitasking have primarily focussed on its cognitive implications, such as recall, comprehension, and task performance (Lang and Chrzan, 2015, Jeong and Hwang, 2016). These studies, primarily quantitative in nature, demonstrated that media multitasking results in poor cognitive performance during media multitasking. They implied that exposure to an advertising message during media multitasking results in poor memory and poor comprehension. Conversely, studies suggested that media multitasking leads to an improvement in the attitude to and persuasion of the message (Jeong and Hwang, 2012, 2015). In contrast, some studies found that it is equally detrimental to attitude towards the advertised brands (Segijn et al., 2016). The only common link between these studies has been the underpinning theories of the capacity model of attention (1973) and limited capacity model (Lang, 2000), which explain the less than normal cognitive performance of individuals while media multitasking. Angell et al. (2016) were one of the first scholars to identify that not all media multitasking is bad for advertisers when they found that related tasks and social motivation to perform one of those tasks lead to better memory of brands. Another vital contribution of Angell and his colleagues (2016) was to explain the effects of media multitasking through the lens of motivation, opportunity and ability (MOA) framework. They suggested that in order to understand the effect of media multitasking, an individual's motivation, ability and opportunity to process information are crucial for the encoding, retrieval and persuasion process. Although the opportunity to process the message is definitely reduced while media multitasking, the motivation and ability to process the message are not curtailed. The MOA framework provided a strong basis to believe that there are different contexts and circumstances that can lead to different effects on information processing while media multitasking. Hence, Angell et al. (2016) provided direction to explore new contexts and circumstances of media multitasking that may have positive advertising effects.

There are quite a few media multitasking research studies that tested the information capability of individuals and among them were only a few that primarily focussed on the information processing of advertising messages. Most of the advertising research on media multitasking supported the non-advertising research on the cognitive inability to process information while media multitasking. These studies reported lower brand memory while media multitasking (Jeong and Hwang, 2016), however there were a few exceptions, such as Duff and Sar (2015), Angell et al. (2016) and Segijn et al. (2017) that emphasise processing style (Duff and Sar), the social context of tasks (Angell et al., 2016) and the relationship between tasks (Segijn et al., 2017) as leading to improved memory of brands while media multitasking. Similarly, there was also a discrepancy between studies that tested the media multitasking effect on brand attitude. Kazakova et al. (2016), Chinchanachakchoi et al. (2015) and Segijn et al. (2017) found that the attitude towards the advertised brand increases while media multitasking, whereas Yoon et al. (2011) and Segijn et al. (2016) found that people reported a decrease in attitude towards the advertised brands while media multitasking. The media multitasking studies that assess the effect on brand memory and brand attitude only compare single-tasking with media multitasking. A particular study that evaluates the spectrum of media multitasking by comparing low media multitasking with high media multitasking was missing. This type of study could unravel the effect of media multitasking on brand memory and brand attitude in an elaborate way in order to confirm segmentation within media multitasking.

Another issue with the extant literature of media multitasking is the dependence on the capacity model of attention (Kahnemann, 1973) and the limited capacity model (Lang, 2000) for understanding media multitasking effects. Both these theories focus on the demands imposed by multiple tasks on limited cognitive resources. The detrimental effect of media multitasking has been explained by these above-mentioned theories as increased demand on cognitive resources and an inability to supply all resources exclusively to multiple tasks and eventually dividing cognitive resources. An additional task increases the cognitive load on the resource centre, which means taking a share of the limited cognitive resources. In fact, the use of additional media does not always result in an increase in the cognitive load. It is more likely that it increases perceptual load rather than cognitive load (Lavie, 2005). Perceptual load serves as the wall or a barrier that blocks or inhibits distractor processing, whereas cognitive load reduces the executive control capacity, which increases the distractor processing (Wang and Duff, 2016). According to Lavie's (2005) perceptual load theory, when people experience cognitive load, they are unable to maintain their focus on the primary task and are easily distracted whereas when they experience perceptual load, they are more focused on the primary task as they do not have spare perceptual resources to notice any distractions. Therefore, the load type is an essential element to determine the effect of media multitasking. Psychological studies have tested the effects of different load types but media research, and more specifically advertising research, have not identified and applied the role of load types. Hence, a media multitasking study is required to test the effects of different load types.

The work of Angell et al. (2016) provided a breakthrough in media multitasking studies by identifying the relatedness of tasks and their social accountability as having a positive effect on the memory of advertisements. Segijn et al. (2017) followed up on Angell et al.'s work and also identified that relevant tasks performed on two different devices at the same time do not have a detrimental effect on information processing. Both the studies emphasised that related media multitasking resulted in favourable advertising outcomes. In the literature, various concepts have been used to explain relatedness in media multitasking, such as task relevance, congruency, redundancy and repetition. Duff and Segijn (2019) provided a typology of three different types of relatedness, which are not mutually exclusive and can coincide or overlap. The first type of relatedness is task relevance or related tasks, which is defined as "tasks involved in media multitasking serving closely related goals (or a single overarching goal") (Wang et al., 2015, p. 109), for example, tweeting about the content being watched on the television. The second type is known as congruency, when the advertisement shown on a media is related to its context, e.g. an advertisement for a car during the telecast of Top Drive/The Grand Tour. The third type is known as repetition, when the same message or advertisement is presented on two devices, e.g. when the ad of the same brand is shown on the television and on social media. The first type of relatedness has demonstrated positive outcomes for advertising through the work of Angell et al. (2016) and Segijn et al. (2017). However, the other two types of relatedness have not been researched extensively. This provides an opportunity to fill a significant research gap in media multitasking literature.

With the constant use of smartphones and the advent of new technologies and data mining by marketers, a new form of advertising has emerged, known as synchronised advertising (Segijn, 2016). It is an individually targeted advertisement facilitated by the individual's current media usage. For example, a person might receive an advertisement on their smartphone based on the content they are watching on television, or they receive an advertisement on their smartphone related to the massive billboard they are just passing, or they receive an advertisement on their smartphone related to the content podcast they are listening to (Segijn, 2020). This form of advertising is new and is becoming popular globally, but there is a major need to study this phenomenon academically. There has been one important research project that has examined the effect of synchronised advertising on brand attitude (Segijn and Voorveld, 2020). However, the underlying reason for the effect of synchronised advertising and the contexts in which its effect can be stronger is yet to be tested. To the best of my knowledge, there has been no research on synchronised advertising other than Segijn and Voorveld (2020). The implications for further research in synchronised advertising will be highly important for advertisers in order to decide whether to invest in this form of advertising. The findings of synchronised advertising research will also be relevant for policy makers in order to understand its implications in terms of data usage and sharing between advertisers and media content providers.

1.4 Research Questions and Research Objectives

With regard to my motivation to conduct this research and the research gaps identified in the previous sections, the main research question of this research is:

When does media multitasking result in favourable advertising effects such as better memory and a better attitude towards advertised brands? And what is the underlying reason for the positive advertising effect?

In considering the above-mentioned research question, this research has the following research objectives:

The first objective of this research is to examine the effect of media multitasking on the cognitive and affective outcomes of advertisements and compare these outcomes at varied cognitive loads (low media multitasking vs high media multitasking).

The second objective of this research is to understand the effect of media multitasking through different forms of load, which will be accomplished by looking at the role of differing difficulty experienced in media multitasking and its effect on the cognitive outcome (brand memory) of advertising.

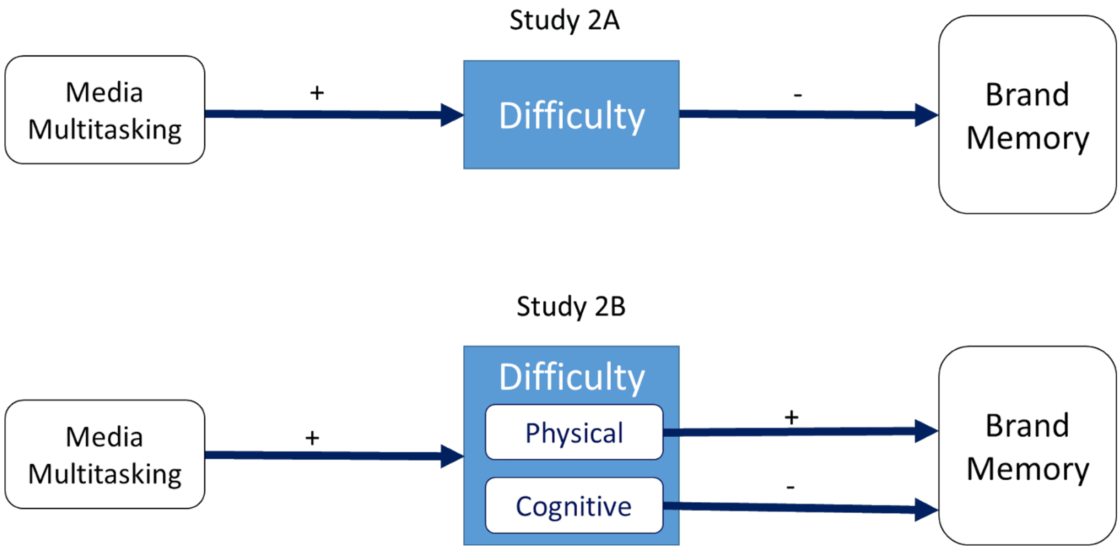
The third objective of this research is to test the underlying role of ease (processing fluency) in the effect of synchronised advertising on cognitive (brand memory) and affective (brand attitude) outcomes during media multitasking.

1.5 Theoretical Framework and the Research Hypotheses.

The present study relies on predominantly three theories to explain the effect of media multitasking on advertising outcomes such as brand memory and brand attitude and the underlying reasons for those effects. Firstly, taking insights from the early empirical studies on communication research (Armstrong and Greenberg, 1990; Armstrong and Chung, 2000) and multitasking (Pool et al., 2003), this research applies the capacity model of attention (CMA) (Kahnemann, 1973) and limited capacity model (LCM) (Lang, 2000) to argue that media multitasking has a negative effect on the cognitive ability of individuals. Taking cues from previous media multitasking studies (Bellman et al., 2012; Duff and Sar, 2015; Segijn et al., 2016), the first study uses the CMA and LCM to test the brand memory and brand attitude of targeted block advertisements after engaging people in media multitasking. In the first study, the inhibiting effect of media multitasking is explained using CMA and LCM, as these theories focus on the capacity interface of multitasking.

In the second study, the focus is on the structural interface of media multitasking; therefore two different types of loads of media multitasking are compared and their effect on advertising outcomes is measured. Physical and cognitive loads of media multitasking are compared using the multiple resource theory (Wickens, 2002). It is argued that the difficulty experienced in media multitasking mediates the effect of media multitasking on the memory of advertisements seen whilst media multitasking. It is further argued that physical difficulty experienced during media multitasking will have a positive effect on the memory of advertisements, while cognitive difficulty will have a negative effect on the memory of advertisements. Using two inter-related studies (2A and 2B), these effects are tested using the causal chain design approach of Spencer et al. (2005). In this causal chain design, the mediator is measured in the first study (2A) and is manipulated in the second study (2B) as this offers a more powerful methodological approach (Mostafa and Bottomley, 2018; Geuens and de Pelsmacker, 2017). Figure 1.2 presents the conceptual framework for the second study.

Figure 1.2: The basic conceptual model of the impact of media multitasking on brand memory via difficulty experienced during media multitasking.



The present study, relying on the multiple resource theory, supposes media multitasking results in difficulty with processing both tasks, which eventually results in poor memory of advertisements. In the second experiment of this study, it is proposed that the type of difficulty experienced will have an inverse effect on the memory of advertisements.

Lastly, the third study of this research relies on the theory of multiple source effect (Harkins and Petty, 1981) to explain the effects of synchronised advertising. As per the multiple source effect, the synchronised advertising is expected to result in a positive evaluation of advertisements and increased memory of those advertisements. The third study also proposes that processing fluency or ease of processing mediates the positive effect of media multitasking. It is also proposed that receiving the same advertisements on two different devices at the same time will raise privacy concerns and affect processing fluency. This study also proposes that the physical attractiveness of the models used in the advertisements would also affect processing fluency. Figure 1.3 presents the conceptual framework of the third study.

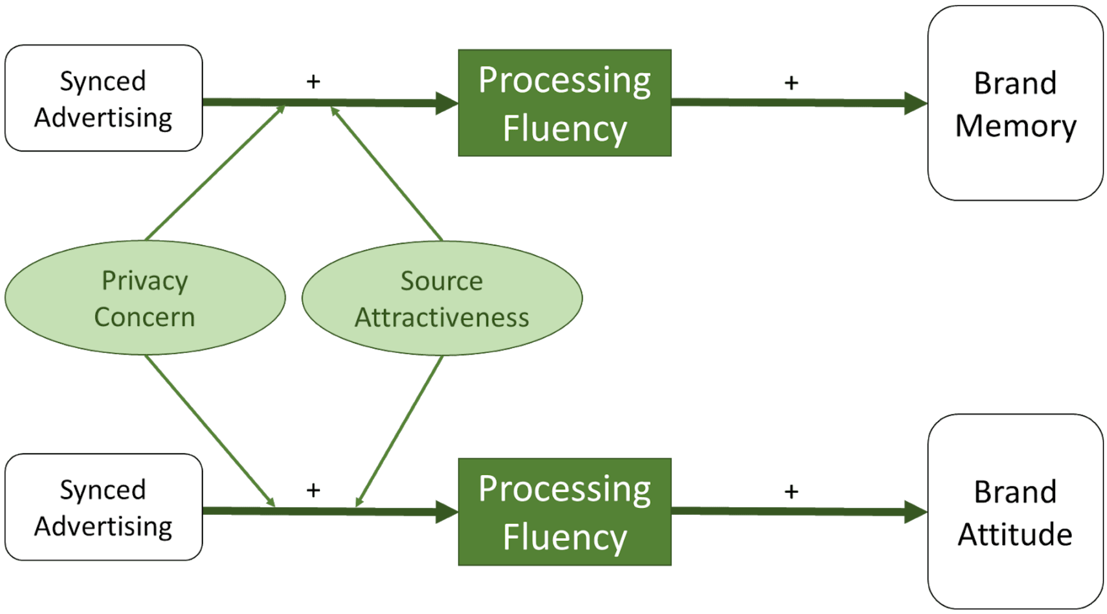


Figure1.3: The basic conceptual model of the impact of synchronised advertising on brand memory and brand attitude via processing fluency; moderated by privacy concerns and source attractiveness

According to the conceptual model presented in Figure 1.2, processing fluency is the mediator of the effect of synchronised advertising on brand memory and brand attitude. Whilst privacy concerns and source attractiveness are moderators of the effect of synchronised advertising on processing fluency. It is proposed that when people receive synchronised advertisements, those with higher privacy concerns will process the advertisements easily as they might see them as a violation of their privacy. On the other hand, it is presumed that people who find the models in the synchronised advertisements highly attractive will not fluently process the message.

Accordingly, and through the course of the next chapter, i.e. the literature review, thirteen research hypotheses are developed. Table 1.1 summarises these research hypotheses, which will be empirically tested in subsequent chapters to address the objectives of the research.

Table 1.1: Summary Research Hypotheses

	Study No.	Hypothesis
H1	1	Media multitasking negatively affects the memory of the ads as compared to single-tasking.
H2	1	Media multitasking positively affects the attitude towards the brand as compared to single-tasking.
H3	1	High cognitive load (heavy media multitasking) negatively affects the memory of the ads as compared to low cognitive load.
H4	1	High cognitive load (heavy media multitasking) positively affects the attitude towards the brand as compared low cognitive load.
H5	2	Media multitasking is perceived to be more difficult than watching a single screen.
H6	2	Media Multitasking will be negatively related to advertising memory.
H7	2	Difficulty mediates the effect of media multitasking on advertising memory.
H8	2	Physically difficult media multitasking will have a positive effect on advertising memory.
H9	2	The cognitive difficulty will have a negative effect on the memory of the brands shown on TV.

H10	3	Synced advertising would result in positive (a) cognitive responses (brand memory) and (b) affective responses (brand attitude) than non-synced advertising.
H11	3	People who receive synced ads will have better processing fluency and will, therefore, have (a) better memory and (b) better attitude of the advertised brands than the people who do not receive synced ads.
H12	3	The mechanism via which the synced ads increases (a) brand memory and (b) brand attitude by increasing the processing fluency is based on the individual's privacy concern. Specifically, the effect of synced ads on the processing fluency is stronger for individuals with high privacy concern.
H13	3	The mechanism via which synced ads increases the (a) brand memory and (b) brand attitude by increasing the processing fluency is based on the individual's perception of the attractiveness of the celebrity endorser. Specifically, the effect of synced ads on the processing fluency is weaker for individuals with a higher perception of endorser's attractiveness.
H14	3	The mechanism via which synced ads increases the consumers' (a) brand memory and (b) brand attitude by increasing their processing fluency is contingent upon the individuals' privacy concern. Specifically, the effect of synced ads cues on processing fluency is weaker for the individuals' with higher source attractiveness.

1.6 Research Methodology and Research Design

One of the most crucial aspects of understanding research is to define its epistemology, i.e. its theory of knowledge, in terms of methods, validity and scope in relation to the social world (Bryman, 2012). The epistemological issues are concerned about whether social research can be undertaken using the same principles, procedures and ethos as natural science (Thomas, 2004; Bryman 2012). Social sciences generally follow two main epistemologies, i.e. positivism and constructivism (also known as interpretivism) (Thomas, 2004). There are many differences between the two epistemological orientations, and Table 1.2 illustrates the key differences between the two.

Table 1.2: Key differences between positivism and constructivism

Epistemology/Theory of Knowledge	Positivism	Constructivism
Preferred conceptions of:		
The human world	Set of natural objects	Set of human meanings
Analytical Approach	Variable analysis	Cultural analysis
Theory of human behaviour/action	Behaviourism	Symbolic interactionism
Relation between structure and action	Explain action in terms of structures	Explain structures in terms of actions
Knowledge	General, nomothetic, universal	Particular, ideographic, contextual
Data	Given, found	Constructed
Method of securing data	Data collection via observation	Data collection via interpretation

Description	Quantitative measurements	Qualitative measurements
Explanation	Statistical relations	Narrative relations
Causal emphasis	External to internal	Internal to external
Prediction	Based on statistical forecasts	Based on understanding of typical behaviour in typical situations
Preferred research approach:		
Research Strategies	Experiment, quasi-experiment, survey	Case study, ethnography, action research
Research Methods	Self-completion questionnaire, structured interview, structured observation, psychological tests	Unstructured interview, participant observation, personal documentations (diaries, letters, etc.)
Analytical Methods	Multivariate statistical analysis	Hermeneutics
Methodological Problems	Internal validity, contextualisation	Generalisation, replication
Symbol/Image	Hard, science, physics, variable net	Soft, humanities, anthropology, cultures

(Source: Adapted from Thomas, 2004, p.127)

This research follows the route of positivism as it embodies the same methods and principles that are followed by natural sciences to study the social sciences (Bryman, 2012). Positivism is more suited for this research as it explores the causal relationships between the investigated variables as well as quantifying the investigated effects (Thomas, 2004). Positivist research allows the researcher to control the biases that are usually experienced in social science research and improve the application of its results in the real world (Thomas, 2004).

In terms of the methodological approaches followed by social science researchers, the two main options are either using quantitative or qualitative research methods. Table 1.3 sets out the key differences between the two methodologies.

Table 1.3: The main differences between quantitative and qualitative research

Qualitative Methods	**Dimensions of contrast**	**Quantitative Methods**
Constructionism	**Paradigms**	Positivism
Typically narrative	**Form of Data**	Typically numeric
Exploratory	**Purpose of Research**	Confirmatory
Grounded Theory	**Role of Theory**	Rooted in conceptual framework or theory
Mostly purposive	**Sampling**	Mostly probability
Thematic strategies	**Data Analysis**	Statistical analysis

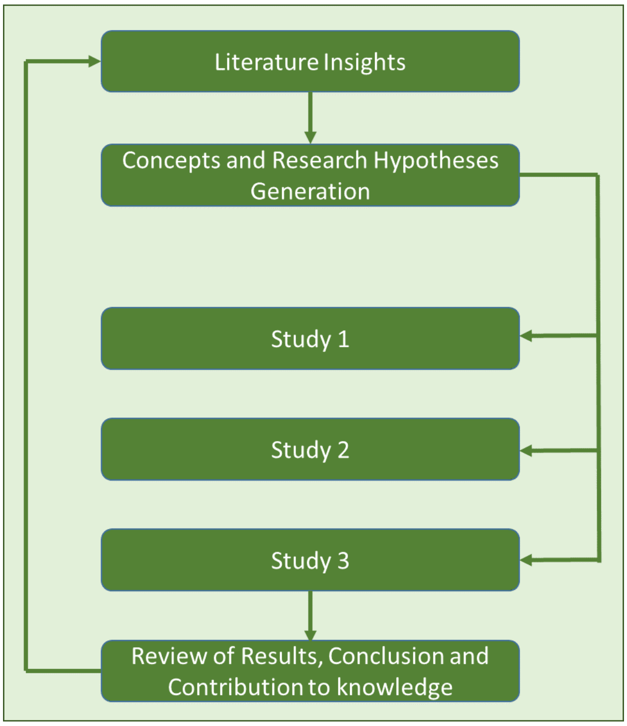
(Source: Adapted from Tashakkori and Teddie, 2009)

In this research, the use of the qualitative approach is restricted to developing an understanding of concepts which is then applied using quantitative methods in order to test, validate and contribute to the literature by studying the relationship between these concepts. This research applies the same quantitative methods that are used by the behavioural sciences that involve empirical data collection and data analysis (Bryman, 2012).

This thesis uses three main experiments to test the research hypotheses. Although there are four experiments in total, Study 2 involves two complimentary experiments. The research design, sampling, methodology and analysis techniques differ between all the experiments and are applied based on their suitability for each experiment.

Figure 1.4 presents the schematic research design and summarises the whole thesis by presents the flowchart that informs the sequence of studies/ pre-tests conducted in this research.

Figure 1.4: A flowchart of the sequence of studies in this research



Source: This study

1.7 Findings and Contribution

This research provides empirical findings and draws conclusions that broaden the understanding of media multitasking, the role of difficulty and its effect on memory and attitudes towards advertised brands.

First, in order to deduce the effects of media multitasking on advertising outcomes a confirmatory experiment was undertaken. There were contradictory findings in the media multitasking literature, therefore in order to affirm the media effects of multitasking an empirical study was conducted. The results aligned with the majority of previous studies by demonstrating poor memory of advertisements. However, neither did this study establish a strong result for the effect of media multitasking on brand attitudes. In addition to this, the most important contribution of this study was that it tested the continuum of media multitasking by comparing low and high media multitasking and identified that not all media multitasking is detrimental. Low level media multitasking is not as detrimental as high level media multitasking. Another important contribution of this study was that it identified that media multitasking was considered difficult by the participants and it was related to poor memory and attitude towards the brands.

Building on the results of study 1, the second study looked at the role of difficulty in more detail. The second study contributed to the extant literature of media multitasking both theoretically as well as methodologically. Using a two-part experiment this study demonstrated the mediating role of difficulty in the effect of media multitasking on brand memory. In the first experiment, the difficulty was measured and in the second experiment the difficulty was manipulated to apply the causal chain design approach (Mostafa and Bottomley, 2018; Spencer et al., 2005). It was found that the level of difficulty does not entirely restrict the cognitive abilities of individuals while media multitasking. The cognitive difficulty results in the detrimental effect of media multitasking on advertising, whereas, the physical difficulty experienced during media multitasking does not decrease the brand memory of the advertisements seen during media multitasking.

In the last study, the role of difficulty was inverted and the role of ease of academically processing, known as processing fluency, was tested. The third study looked at the effectiveness of synchronised advertising, a new form of data-driven advertising and its effect on brand memory and brand attitude. It was found that synchronised advertising results in better memory and a higher positive attitude towards the advertised brand during media multitasking and this effect is mediated by processing fluency. The synchronised advertising increased the processing fluency which increases brand memory and brand attitude. Another important contribution of this study was the moderating role of privacy concerns and the attractiveness of advertising models in the effect of synchronised advertising on processing fluency. It was found that people with higher privacy concerns had higher processing fluency whereas people who found the models used in the advertisements highly attractive had poor processing fluency. Thus, the role of processing fluency is central in the synchronised advertising effect, which can be moderated by privacy concerns and the attractiveness of advertising models. The effects are not very strong but suggest opportunities for further research to explore different variables and their moderating role on processing fluency.

1.8 Structure of thesis

Figure 1.4 presents the structure of the thesis.

Chapter 1 – Introduction: This chapter introduces the research area and sets out the motivation and objectives of the research while identifying the research gaps in extant literature. It also briefly presents the theoretical framework and the research hypothesis and sets out a brief description of the methodology used. Finally, the key findings and the contribution of this thesis to existing literature are outlined.

Chapter 2: Literature Review: This chapter starts with an explanation of the advertising concept and identifies the challenges and opportunities arising for it with the growth in media multitasking behaviour. Media multitasking and its effect on cognitive and attitudinal advertising outcomes are detailed. A thorough review of the media multitasking literature is provided. It then explains the main theories relevant in explaining the effects of media multitasking. Finally, it identifies the research gaps and develops the hypothesis of this research.

Chapter 3: Study 1: Single-tasking vs Low Media Multitasking vs High Media Multitasking: This chapter discusses the design and methodology of the first experiment, reports the findings from the pre-tests and reviews the empirical results derived from the first experiment carried out with 105 participants from the University of Plymouth.

Chapter 4: Study 2: The role of difficulty in explaining the processing of advertising messages while media multitasking: This chapter discusses the design and the methodology of the two experiments carried out in the second study. It also reflects on the empirical results from both of the studies conducted in India with 180 people from three different universities.

Chapter 5: Study 3: The underlying mechanism of synchronised advertising and its effect on brand memory and brand attitude: In this chapter, the design and the methodology of the third study are discussed. The findings from the pre-test and then the findings of the main study are presented. Finally, there is a reflection on the results of the study, which was conducted with a sample of 126 students from the University of Plymouth.

Chapter 6: Discussion and Conclusions: In this chapter, the findings from the literature review and the empirical investigations of this thesis are summarised. The results are discussed in context with the research question and objectives to provide the conclusion to this thesis. It also presents the contribution of this research to theory and its implication for the advertising world. The chapter concludes by highlighting some limitations of this thesis and providing suggestions for future research.

1.9 Summary

This chapter outlined the research area and the research background of this study. It also presented the research objectives and the hypothesis that will be tested in the subsequent chapters. Methodology, findings and the contribution of this thesis are also highlighted. The next chapters discuss individually each of the topics following the structure presented in Figure 1.4

CHAPTER TWO: LITERATURE REVIEW

2.1 Overview

An average person is awake for 15 hours 45 minutes during a day; in 2010, almost half of that time, i.e. over seven hours were spent engaging in media and communication activities (BBC, 2010). With the advent of new technologies and their widespread usage, such as smartphones, online media content (Netflix, Amazon Prime, YouTube), and social media (Facebook, Twitter, WhatsApp), the consumption of media has changed considerably over the past few years (Ofcom, 2019a). The easy access of multiple media devices like laptops, tablets and smartphones, and faster internet connections has led to the increased time spent on each device (Ofcom, 2019a). As there has been increased use of these devices, the time spent on watching broadcast TV has reduced, but still, it is the major source of media consumption (Ofcom, 2019b). People in the UK watched an average of just over 3 hours of broadcast TV in 2018, which is almost an hour less than what they used to watch in 2012 (Ofcom2019b). The consumption of media from other devices like tablets and smartphones has increased significantly (Ofcom, 2019b). On a global average, people spent an hour and forty minutes using mobile devices like smartphones and tablets in 2013; this increased to almost three and a half-hour in 2019 (O'Dea, 2020). However, the time spent on these devices is not always on its own and is often overlapped by using one or more devices at the same time. The use of two or more media devices simultaneously is known as media multitasking (Voorveld, 2011).

Almost every adult (99%) in the UK uses two or more media simultaneously at some point during the day (Ofcom, 2015). According to an Ofcom report (2015) on media multitasking in the UK, texting on a smartphone is the most likely activity to be conducted simultaneously with other media. Watching TV while using a smartphone for texting or browsing through social media feed is one of the most recorded media multitasking combinations with an average time of 1 hour 12 minutes per day. It means that one-third of the total TV viewing time involves the simultaneous use of a mobile phone—the changes in media consumption call for the changes in the content of the media. Advertising is a core component of all media and changes in media content inevitably change advertising.

The worldwide spending on advertisements in 2019 was over $545 billion, and the advertisers in the United Kingdom spent $29.1 billion of it, the fourth highest in the world and the largest in Europe (Guttmann, 2019). Advertising spending in the UK has continuously grown from $16.3 billion in 2006 to $29.1 billion in 2019 across all media (Guttmann, 2019). Television accounts for 36% of all the advertising spending across the world and in 2019, it was the largest medium based on the spending share. The increased use of media consumption on digital devices has increased digital advertisement spending, which has challenged the strong position of TV advertising. In 2020, digital advertising surpassed TV advertising in terms of advertising expenditure (Guttmann, 2020).

This chapter provides an understanding of the concept of advertising by reviewing the literature on advertising and media multitasking. It further assesses the effectiveness of advertising and focuses on the challenges and opportunities emerging from media multitasking behaviour, which is the new norm for media consumption. Accordingly, this chapter has three parts:

1. Advertising: Explaining what advertising is and how it works.

2. Review of media multitasking literature and its effect on advertising.

3. Hypothesis development: Identifying research gaps and rationale for further study.

2.2 Advertising

2.2.1 What is advertising?

Oxford English Dictionary defines advertising as: *'describe or draw attention to (a product, service or event) in a public medium in order to promote sales or attendance* (Oxford English Dictionary, 2020). This definition sums up the effect of advertising to turn people towards it to gain information about a product, service or event. In addition to grabbing attention, advertising also aims to create a favourable impression of the advertised product on its potential customers, which is also called a positive attitude (Percy and Elliot, 2016).

The origin of advertising can be traced as far back as ancient civilisations when people started selling goods and services and had a medium to communicate a message (Tungate, 2007). Archaeologists have discovered the earliest advertisements in the form of wall paintings in Rome announcing gladiator fights, placing pottery in Phoenician streets to promote wares, and evidence of town-criers announcing the sale of cattle in ancient Greece (Kotler and Armstrong, 2018). Table 2.1 presents a timeline of important events relevant to advertising.

Advertising has evolved from wall paintings to digital billboards, from placing pottery in streets to personalised advertisements on a smartphone, and from town-criers to celebrity endorsements; it is not just a means to support selling but is a billion-pound industry on its own.

Table 2.1: Historical development of Technologies and Advertising

Circa	
3000 BC	A Babylonian clay tablet bearing inscription of an ointment maker
400 BC	Criers in ancient Greece
AD 79	Engraved stones promoting gladiator fights and brothels preserved following Vesuvius eruption
1140	Criers widely employed in France
1441	The invention of the Printing Press
1477	First English Advertisement by William Caxton
1622	The first English newspaper; Nathaniel Butter
1625	First English newspaper advertisement
1740	First printed outdoor posters (hoardings)appears in London
1896	Invention of Radio
1922	British Broadcasting Company is founded
1922	First paid Radio commercial in the USA
1925	First demonstration of television in London
1930	Installation of television at British Prime Minister's Residence
1936	Summer Olympics are broadcast for the first time on television
1941	The first advertisement on television is broadcast in the USA
1947	Televisions across the UK and the USA are widely used after the second world war
1954	First Colour Broadcast on Television
1973	Development of Mobile Phones
1989	The invention of the World Wide Web, embarking Informational Age.
1994	First advertisement on the Internet
1996	Internet-enabled mobile phones
2000	First advertisement on a mobile device

Sources: Russel and Lane (2002); Egan (2007); McCambley (2013); Lynn (2016)

Technological development has played a significant role in transforming advertising over the years and especially in the past 100 years. Advertising has evolved with the advent of newer technologies, e.g., first the emergence of the printing press in the 15th century and then in the 20th century, the rapid transformation through radio and television broadcast, internet and mobile. These technological developments have established different media which communicate advertising messages, e.g. TV, magazines and social media. These media can be categorised into traditional media or digital media.

Traditional media is referred to as the media channels such as newspapers, radio, television and billboards. They are termed traditional as they have been used for decades (Shah, 2020). At the same time, digital media is referred to as a media channel over the internet, e.g. ads on websites (banner ads), e-mail advertising, online video ads, in-app advertising (Andrews and Shrimp, 2018). The advertisement could be delivered on each channel separately or integrating several media to deliver an advertising message. For example, a company can communicate to its target or potential market by placing ads between TV shows or radio broadcasts, or billboards on motorways, or personalised ad on the social media feed. In addition to the key advertising techniques mentioned above, there are other techniques to create awareness and a favourable attitude towards the brand, such as product placement in movies, songs or video games and sponsoring events (Percy and Elliot, 2016).

Advertising is not only used by businesses to sell their products but also by not-for-profit organisations, professionals and social agencies (Kotler and Armstrong, 2017). Advertising helps inform, persuade and engage people whether the purpose is to sell Pepsi worldwide, to create awareness about the new education policy by the government, or educate people about the symptoms of the Corona Virus.

2.2.2 Advertising and Communication Objectives

It is essential to consider that advertising is only a part of a marketing plan; in fact, it is one of the elements of the promotion section of the marketing plan. A marketing plan consists of four sections, product features, pricing structure, promotion tools and distribution plan (Kotler, 2017; Percy et al., 2001). However, advertising includes all the other sections of the marketing plan, such as communicating the product features, highlighting the product's price and its availability in stores nearby.

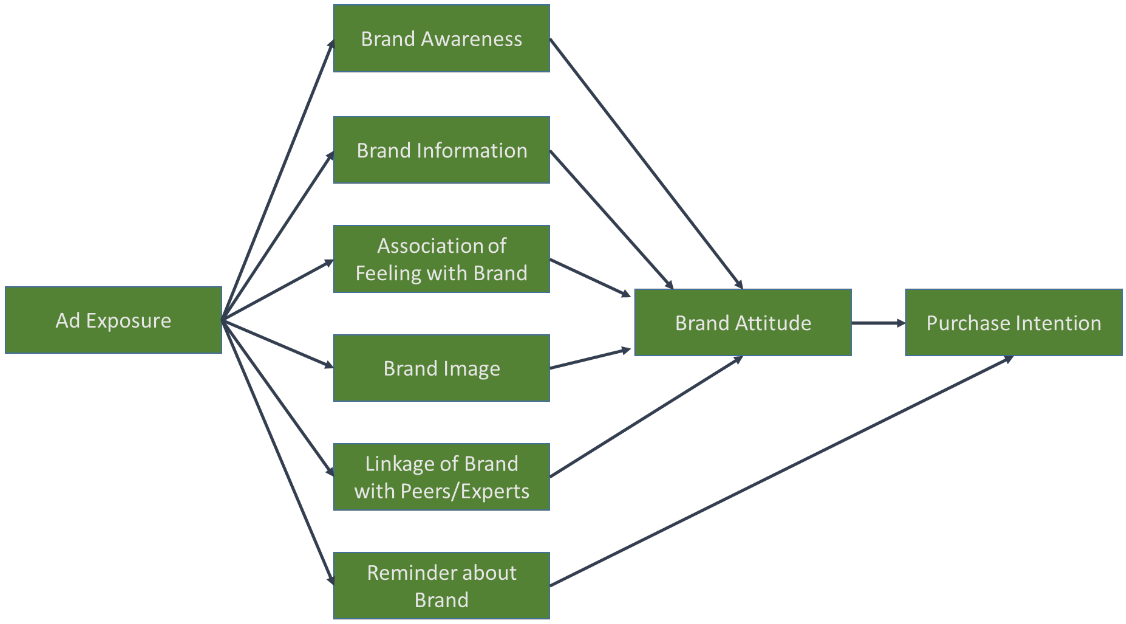
Figure 2.1: Advertisement of Fiat 500

In simple terms, an advertisement is a communication of a message (Percy et al., 2001). Successful delivery of a message requires a person must see or hear the message, pay attention to it, be able to understand it and then act upon the message in the desired manner. This sequence is known as the four steps of communication response and is essential whether the message is from a parent, manager, friend or an advertiser (Percy et al. 2001). For instance, for the Fiat 500 ad to work on social media sites (Figure 2.1), a potential buyer must first pick up her/his phone and scroll through their social media feed to see it. While scrolling through, they must notice the advert and spend enough time to understand it. They must then associate a feeling with the brand in response to the idea of *'bigger isn't better'* and think to themselves that it is the perfect sized car for their needs and they must consider buying Fiat 500.

In the real world, the ad would not be able to achieve all the steps of communication response for every customer. Some people might straight away ignore it by scrolling past it, some who might pay attention to the ad but might not feel positively for the brand. People might have to come across the ad several times to register it into their memory and associate a positive feeling with the brand (Percy and Elliot, 2016). Finally, when they are buying a car, they might not remember Fiat 500 and the positive feeling associated with it.

For an advertisement to result in a successful purchase, it has to go through a process. The basic model of communication of an advertising message is presented in Figure 2.2; it shows the various processes that can occur after a consumer is exposed to an advertising message (Batra and Aaker, 1996).

Figure 2.2: Advertising Communication Process



According to Batra and Aaker (1996), the exposure to an ad (i) creates awareness about the brand, leading to a feeling of familiarity with it, (ii) it also registers the brand's benefits and attributes to the consumer, (iii) it can also generate feelings in consumers that they begin to associate with the brand or its consumption, (iv) creation of a brand image through the use of spokesperson and various execution devices (e.g. logo, tagline), (v) can create the impression that consumer's peers/experts prefer the brand and it is fashionable. These five effects create a favourable liking or attitude towards the brand, which eventually can lead to an intention to purchase. The intention to purchase can also be influenced by reminding the customer about the purchase through advertising. However, this can only happen for the products for which consumers are aware, have information and image in their minds.

2.2.3 How does advertising work?

When marketers place ads, they expect to achieve a specific objective based on their advertising strategy. Each ad has a well-defined objective to achieve through a creative and distinct message. Every advertising and marketing message has the potential to have four communication effects: the need for the category, brand awareness, brand attitude, and brand purchase intention (Rossiter and Percy, 1987). The four communication effects are discussed below.

Category Need: There must be at least some interest in the product category or need for the product to make a purchase decision. For example, a person would not buy a Fiat 500 if she/he does not need a car. The category need objective is essential even for other products, e.g. beer. An ad of a beer brand will not influence a person to purchase beer if they do not drink alcohol, whereas it might be highly influential on people who enjoy drinking beer frequently.

Brand Awareness: It is essential to identify the brand before making the purchase. There are two types of brand awareness: recognition and recall (Percy and Elliot, 2016). Recognition of a brand is done at the time of purchase. Whereas brand recall happens before the time of purchase when the need for the product arises. For example, brand recognition would happen when a person identifies Fiat 500 at the car dealership when they are about to make a purchase. Brand recall happens when a person would think of Fiat 500 when the idea of buying a new car comes up.

Brand Attitude: describes a person's evaluations, feelings and opinion towards a brand (Kotler and Armstong, 2018). The favourable attitude towards a brand is developed through a combination of preexisting knowledge and learning about the brand. It is not enough to make a purchase decision, but it is essential to have a favourable attitude towards the brand to enable the purchase decision (Percy and Ellito, 2016). A person will only buy a Fiat 500 if they have a favourable attitude towards the brand.

Purchase Intention: is the ultimate objective of advertising and promotion communication. People might be aware of several brands and they might also have a favourable attitude towards a few of them, but that does not always result in a purchase intention. Purchase intention refers to thoughts such as 'I'll like to buy that' or 'I'll buy that'.

These four communication effects aid marketers to select an appropriate communication objective. While all these effects can be part of a communication objective but they are not always required to be an objective. For instance, an ad might have an objective to remind the need of the product category but would not focus on the purchase intention, e.g. the British Gas ad (Figure 2.3) which reminds its consumers of the need to conserve energy. The tagline 'Are you leaving your roof open every day?' and the picture of a house reminding people that improper insulation costs households a loss of energy and, therefore of the need to have proper loft and cavity wall insulation. The ad does not explicitly promote purchasing British Gas services but focuses on the category need, awareness about service and delivering knowledge. Whereas the Burger King ad (Figure 2.4) communicates buying an Angus Steakhouse Burger by reminding the customer of the buy one get one free offer. The ad does not focus on the category need but focuses on the purchase intention, awareness of the brand and knowledge of the offer. The category need and purchase intention are not always the communication objectives, but brand awareness and brand attitude are always the communication objective of every ad (Rossister and Percy, 1987; Percy and Elliot, 2016).

Figure 2.3: British Gas Advertisement

Figure 2.4: Burger Advertisement

2.2.4 Determining Advertising Effectiveness

It has been pointed out that brand awareness and brand attitude are always communication objectives. Indeed, consumers must be aware of the product they intend to buy and feel positive about it. Brand awareness on its own cannot transcend into the purchase of the product. Similarly, the brand attitude cannot result in purchase unless there is awareness about the product. Both of the advertising objectives are vital in achieving advertising effectiveness. The key components necessary for their effectiveness are covered in the following section:

2.2.4.1 Brand Awareness

Brand awareness is the ability to identify a brand within a product category to make a purchase. There are two ways to identify a brand: recognition and recall. As mentioned in the previous section, both are different from each other, recognition is when a person identifies the brand during the purchase, and recall is when a person is able to identify the brand before the purchase. Fundamentally, the difference between recognition and recall is dependent on which communication effect occurs in the consumer's mind first: the category needs or seeing the brand in-store (Percy and Elliot, 2016). Recognition brand awareness is when the awareness of the brand reminds a person of the category need. For example, when a person sees a logo of FedEx and is aware that it is a multinational postal delivery service company. Whereas recall brand awareness is when the category need occurs, and one remembers brands that would fulfil the need. For example, when a person must send a post to another country by the next day, they recall FedEx would be able to help them.

Exposure is another key element of brand awareness as it is the contact point where the ad is delivered to the target audience (Wells et al., 2012). It is an important goal for the advertisers to try and find the best ways to expose the target audience to the message. Two main decisions need to be made for effective exposure: media selection and media scheduling. Media selection decisions relate to selecting where to reach the target audience most efficiently. Media scheduling decisions relate to how often the target audience must be reached to produce the intended communication response. For example, Nescafe, the coffee brand, does most of its advertising on television, so this would be the primary medium selected if they would launch a new product. They would also have to decide on the frequency of exposing the ad to the target audience to entice them to buy the product.

Attention is another component that facilitates brand awareness. The ability to draw attention and making the product visible is one of the strengths of a good advert (Wells et al., 2012). Novelty or surprise are often used to grab the attention of people towards the brand. For example, Every day, people are exposed to multiple ads of all kinds, and the human brain decides what reaches the conscious mind for further processing, this filtration of stimuli is known as attention (Broadbent, 1958). The higher level of attention to ads is an indicator of advertising effectiveness as it leads to learning more about the brand. For example, FedEx advertisement (figure 2.5), showing them as the fastest delivery service grabbed attention for their unique and surprising ad. FedEx painted their van with a picture of their competitor (DHL) on the rear of the van to show FedEx speeding ahead of DHL to deliver goods faster than them.

Figure 2.5: FedEx Advertisement

2.2.4.2 Brand Attitude

Generating a positive brand attitude is always the objective of every advertisement. People are aware of different brands within a product category, but they only buy the brand for which they have a positive attitude. Brand attitude is the understanding of a customer in terms of how they feel about a brand and how they evaluate its ability to satisfy what they are looking for in the product (Percy and Elliot, 2016). It is necessary to have prior knowledge of the attitude consumer already has for the product or the brand before formulating an advertising strategy (Percy and Elliot, 2016). Brand attitude is dependent on two important dimensions of consumer behaviour: involvement which is related to the type of purchase, and motivation which drives the decision (Rossiter and Percy, 1986).

Involvement refers to the intensity of the consumer's interest in the product (Wells et al., 2012). It is built on the relevance of the product or message to the life and interests of an individual. Certain products require extensive thinking and evaluation before the purchase, as there is a risk attached to the consequences of making the purchase decision. Risk in consumer purchase behaviour is associated with negative consequences of purchase choice. For example, a product may not be worth the financial price paid, or the product may not meet the standards of quality or the product may not be perceived well by the consumer's social groups (Tsiros and Heilman, 2005). The purchase decisions can be categorised into two types of involvements, high involvement purchase decision and low involvement purchase decision. For example, if a person buys hair shampoo, it would be a low involvement decision because they would not be risking much money. Whereas, if a person buys a car, it requires quite a lot of information prior to deciding and intensive evaluation to make the right decision; therefore, it is a high involvement purchase decision.

Motivation in consumer behaviour refers to the drives, urges, wishes or desires that initiate the purchase decision (Russel and Lane, 2002). The motivation to buy a product could be classified into either positive or negative motivation. Any negative mental state that a person seeks to relieve by purchasing a product is known as negative motivation. Negative motivations have a strong effect on purchase behaviour (Rossiter and Percy, 1997). For example, if a person has dandruff and she/he wants to get rid of it, the motivation to buy a dandruff shampoo is negative; similarly negative motivation directs a person to buy health insurance to avoid any financial costs due to an accident. Positive motivation is relevant when a person rewards themself by purchasing a product to feel good. For example, when people buy spa packages for sensory gratification or buy luxury products to uplift their social status (Rossiter and Percy, 1997).

Advertisements to achieve effective brand attitude are made based on the combination of involvement and motivations. As a result, according to Rossiter and Percy (1997), ads reflect one of four combinations of involvement and motivation:

- Low involvement and negative motivation
- Low involvement and positive motivation
- High involvement and negative motivation
- High involvement and positive motivation

Low involvement and negative motivation

Advertisers persuade consumers by providing information about the brand to deal with products that are driven by negative motivations and are low involvement. The information would be presented in terms of benefits the brand provides that would help them resolve their problem or provide relief. For example, Head & Shoulders (Figure 2.6) present an informational ad to cure dandruff. They provide information in terms of clinically proven results that would provide customers with protection from dandruff.

Figure 2.6: Head Shoulders Advertisement

Low involvement and positive motivation

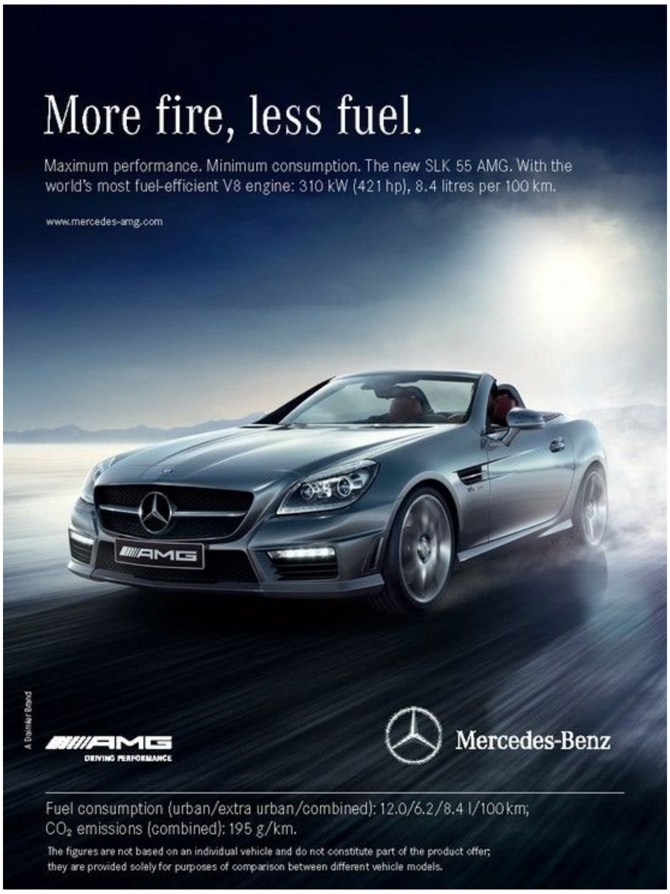
Transformational brand attitude strategy is applied to deal with low involvement products with positive motivation. The transformational strategy emphasises the emotional portrayal of the benefit of using the product. For example, The L'Oreal Elvive shampoo ad (Figure 2.7) presents the product with the tagline 'because you're worth it' to convey the feeling of entitlement or importance to oneself as a reward. The consumer would embody the positive emotion of empowerment linked to the brand after purchasing the product.

Figure 2.7: L'Oreal Elvive Advertisement

High involvement and negative emotion

It is critical to understand the existing attitude of consumers towards the product or brand when developing ads for high involvement products with negative emotions. As it is a high involvement decision, much more cognitive activity would be involved in processing the ad. The negative emotional state is tackled by an informational ad to aid the consumer in solving the problem associated with the product. For example, the Mercedes AMG ad (Figure 2.8) informs the target customer that their high-quality car is exciting with all the best features without compromising on the fuel economy. The ad tries to dismiss the opinion that a high-quality car would be costly to run by clever wordplay; it has more fire (features) but less fuel (higher miles per gallon).

Figure 2.8: Mercedes-Benz Advertisement



High involvement and positive emotion

As in the case with the low involvement positive motivation, the objective for high involvement positive emotion products would be to transform or arouse the emotional feel of the brand. As the brand would be evaluated extensively to avoid any purchase risks, the focus of the ads appeal is on the positive emotions the ad conveys. For example, The Toyota Prado ad (Figure 2.9) appeals to the target customer by communicating the target customers that it is an all-terrain vehicle which is impressive to the urban society as well as the wildlife. The ad arouses the liking towards the car by portraying it as an elegant car attracting attention from people in the city and the animals in the wild. The ad creates an emotional association of allurement with Prado, a 4X4 car.

Figure 2.9: Toyota Land Cruiser Advertisement

In the previous section, advertising and how it works is explained. The objectives of ads and strategies essential for effective advertising were elaborated. In the next section, media multitasking and its background is discussed, and its role in advertising effectiveness is explained by reviewing extant literature.

2.3 Media Multitasking: Background

People perform two or more tasks simultaneously many times during the day. They watch the news on TV or on a mobile device while having breakfast, talk over the phone while reading emails, listen to music while commuting to work or notoriously speak or text over the phone while driving, watch reruns of their favourite sitcom on Netflix while doing chores, listen to a podcast while cooking. The proliferation of technological devices and their use has facilitated carrying out more tasks at a given time. Mobile devices are portable and flexible, which allows users to combine their use with other tasks. This has enabled people to consume more than one media simultaneously, known as media multitasking, e.g. using a mobile device while watching TV.

Media multitasking has been defined as “performing two or more tasks simultaneously, one of which involves media use” (Lang and Chrzan, 2015, p. 100). It can be broadly categorised into three categories (Jeong and Hwang, 2016): (i) a media device and a non-media task, for example, listening to a podcast while cooking; (ii) two separate media devices, such as watching TV while scrolling through social media on a mobile device; (iii) two tasks on a single media, such as texting while watching a video on a smartphone. The tasks during media multitasking could be performed simultaneously or sequentially or by rapid switching back and forth between the tasks (Lang and Chrzan, 2015; Jeong and Hwang, 2016).

Media multitasking is prevalent across people of all ages and has changed the way media is being consumed today (Segijn et al., 2017). The increasing media multitasking has social and psychological implications which have been addressed by scholars in the past decade (Lien et al., 2006; Salvucci and Taatgen, 2008; Ophir et al., 2009; Brasel and Gips, 2011). Their research found that multitasking negatively impacts cognition and its components such as attention, comprehension and memory (Jeong and Hwang, 2016). Although the increase in the use of media is an opportunity for advertisers to communicate their messages, the adverse effects of media multitasking make it a complicated situation. Advertisers strive for optimum cognitive effort from consumers to communicate their message (Zhang and Buda, 1999), but media multitasking deprives them of this opportunity.

Despite the media multitasking's negative effect on cognition, it has not prevented people from media multitasking, nor has it discouraged advertisers from using different media platforms to communicate their message. The effect of media multitasking on advertising outcomes has been under the radar of media scholars for quite some time (Bellman et al., 2012; Duff and Sar, 2015; Angell et al. 2016; Segijn et al., 2017). These studies examined the impact of media multitasking on advertising outcomes and the underlying reasons for their effectiveness. The media multitasking literature examining advertising effectiveness can be broadly categorised into studies that tested (i) cognitive outcomes, e.g. recall or recognition, and (ii) affective outcomes, e.g. brand attitude and purchase intention. Before understanding the above-mentioned effects of media multitasking, It is essential to understand the underpinning theories that dictate information processing during media multitasking. The following section explains the theories related to cognition during media multitasking.

2.3.1 Capacity Model of Attention (CMA)

The first significant theory explaining the underlying effects of multitasking was given by Kahnemann (1973) in his book *Attention and Effort.* The capacity model of attention theorises a general limit on a person's capacity to perform mental work. This model suggests that there is a limited pool of mental resources which limits the capacity to process information by a person at a given time. It also assumes the flexibility of allocation of limited resources among simultaneous tasks.

To process a mental task or information requires inputs such as attention and effort, which are limited in availability. Different tasks demand a different amount of inputs to complete tasks. An easy task requires less effort and attention, whereas a difficult task requires more effort and attention. When the supply of inputs does not meet the demand of the task, the performance of the task hinders or fails. As per the model, a task could not be performed, either because there are not enough inputs to meet its demands or because available inputs are directed towards another task, or there are not enough inputs allocated towards the task.

The total capacity of inputs required to perform a task within the available capacity can be divided into two parts: the capacity allocated to the primary task and the spare capacity. The spare capacity can be used to perform secondary tasks. The inputs allocated to the primary task will not be shared with the secondary task. Therefore, the more inputs are allocated to the primary task; the fewer inputs are available for the secondary task.

There is a central system of allocation policy that evaluates the demands required for each task and supplies inputs to perform those tasks. The supply policy of inputs is based on four factors: (i) *enduring disposition* which reflects attention involuntarily to a stimulus, such as a cocktail party effect, e.g. directing attention to a conversation where your own name is mentioned in a crowded and noisy room; (ii) *momentary intentions* where a conscious decision is made to direct attention towards a particular task or stimulus in the environment, e.g. noticing an attractive person entering in a party; (iii) *evaluation of demands* which assess the attention requirements of multiple tasks which require more than available inputs, e.g. watching a video on a mobile phone while driving requires attention on the road as well as on the screen; (iv) *effect of arousal* on task performance and selection, e.g. tasks in high arousal such as watching a football match will draw more inputs than watching low arousal underwater clip of whales.

According to the capacity model of attention, while multitasking the performance of the tasks will deplete if the multiple tasks require attention more than the available capacity of an individual. In the case of media multitasking when both media require attention, which is a finite resource, the processing of information from both the media will be detrimental. The attention required to process information from both media simultaneously will be more than the attention required for each of the tasks individually. This theory emphasises the structural limitation of the cognitive system and its capacity limitation to processing information simultaneously from more than one media.

2.3.2 Limited Capacity Model (LCM)

The second cognitive theory explains why media multitasking reduces information processing capability. The limited capacity model by Lang (2000) is an information processing model that directly explains how the mediated messages (messages through media, e.g. television) are processed. This model is based on two underlying assumptions. First, individuals are naturally programmed to process information; they automatically indulge in perceiving information from the environment, store them in their memory and reproduce the information in similar or varied forms. Second, individuals can process information up to a certain limit, they have limited resources to process information thus, they cannot process an indefinite amount of information. According to this model, information processing is the result of simultaneously occurring three sub-processes (1) encoding, (2) storage, and (3) retrieval. These processes are explained in the following paragraph.

2.3.2.1 Encoding

This subprocess is associated with getting the message from the environment into the human brain. The message must first engage with sensory receptors (eyes, ears, nose, mouth, skin) (Eysenck, 1993). Once the sensory receptors receive the message, they are entered into the sensory store for each sense (Zechmeister and Nyberg, 1982). These sensory stores are virtually unlimited but stay for a very short duration. The information from the sensory stores is then transferred to the short term memory. The sensory stores hold a lot more information than a person is aware of and thus only a fraction of it is transferred to the short term memory. Two simultaneous subprocesses drive this whole process of encoding, starting from initial exposure to the stimuli to the transfer to short term memory, (a) control process and (b) automatic selection process.

In a media or advertising context, the control process is focused on the viewer's goal, e.g., If a person focuses on a car which is used by a character in a movie, the brand of the car may be selected for encoding in the short term memory.

The automatic selection process is an unconscious and unintentional focus on a particular encoding. Two different types of stimuli drive the automatic selection process. First, the stimuli relevant to the goals and needs of the viewer. For instance, if a person has been looking to buy a new car over the past few weeks, and is watching a movie, she/he will automatically encode the car of the lead character in their short term memory. Second, the stimuli that are novel or unusual in occurrence, for example, if a person sees an attractive car with a never-seen-before feature, she/he would automatically encode that car with unusual features in their short term memory.

In the case of media multitasking, the encoding process suffers from the lack of resources to encode stimuli from two different media. For instance, while watching TV as the primary task and using a mobile device to browse social media, the control process will be directed towards the TV, while the automatic selection process could be triggered by a relevant or novel stimulus on social media. The encoding of information from both the media will not be adequately processed into the short term memory as the encoding resources are limited and are incapable of processing the complete information from both media simultaneously. The inability to encode the information from both media will also affect the subsequent sub-processes.

2.3.2.2 Storage

In the encoding process, a person creates a mental representation of the delivered information in the short term memory. Initially, it is active only in the short term memory where it is interlinked with the old information network. This process of linking the new information with the old information (or memories) is called storage. The more association between the old and new information is made the more life of the new information in the memory will increase, e.g., If a person is watching the TV for entertainment purposes and does not think about it after viewing, it may not use the limited processing resource purposely for storage of details regarding the entertainment show. Whereas, the person watching the news on which he or she may discuss details with colleagues or friends will allocate much more processing resources than a person watching television just for entertainment purpose.

The volume of information from media multitasking draws a large pool of encoding resources but is still incapable of encoding the entire information from the two media. The incomplete encoded information does not create strong links in the memory networks. For instance, while watching a TV show, the viewer might have missed a product placement of a car as she/he would be watching a funny cat video on their social media feed. Similarly, the viewer might have missed the World Wildlife Foundation's save the leopard message following the cat video, as the viewer might have focussed her/his attention back to the TV show. The inadequate encoding of product placement and the wildlife awareness message would not link with the viewer's memory network and thus would fail to make a strong memory.

2.3.2.3 Retrieval

The last subprocess is retrieval and is concerned with recollecting the already stored information in the memory. This process involves searching for the associative memory network for specific information and reactivating it in the short term memory. The information that has strong associative links is more likely to be stored thoroughly and thus easier to be retrieve, e.g. when the content of the television message is encoded in the working memory and well stored, then it should be easily retrieved. Whereas if a message is not well encoded and the limited processing resource was involved in processing additional information, it will be difficult to encode the message. Subsequently, it will be further challenging to store and make associative links and ultimately difficult to retrieve the information as it was presented.

Media multitasking has a negative effect on the encoding and storage of information as a consequence of the limited capacity of resources. Whereas, the retrieval of information is not constrained by resources but dependent on the quality of encoding and storage. In summary, the processing of information while media multitasking draws more resources than from a single media. As the resources required to process information are limited, it creates an insufficient supply of resources which result in impaired encoding and storage of the information and eventual poor retrieval of the information.

To conclude both the cognitive models, CMA and LCM suggest that media multitasking leads to a poor cognitive effect, which has severe implications for the advertisers. With ever-increasing advertising expenses on TV and mobile devices, the advertisers are not able to sustain consumers attention and have a significant effect on their memory.

2.3.3 Elaboration Likelihood Model

The elaboration likelihood model (ELM) of persuasion is a theory relevant to the formation or changing of attitude. The model explains two different methods through which a person can process information delivered to them, why they use that method and their outcome on attitude change (Turner et al., 2012). The two distinct methods by which a person creates a rational attitude are: (i) the *central route* to persuasion, which involves careful thinking and examining information relevant and central to the topic. (ii) the *peripheral route* to persuasion, which involves less cognitive effort and reliance on nonsubstantive elements of the message, which are not directly related to the persuasive message (Petty et al., 2005). To understand the difference between the two, let us take an example of an ad which is being exposed to two different individuals Jack and Daniel, who are both 25-year-old men.

Figure 2.10: TAG Heuer Watch Ad

For instance, Jack and Daniel both are scrolling through their social media feed on their respective smartphones and they come across an ad for a watch brand, Tag Heuer. The ad presents Chris Hemsworth, a Hollywood film actor with the Tag Heuer watch (Figure 2.10). Chris Hemsworth, the brand endorser, is seen smartly dressed and wearing the timepiece. The ad also mentions the hashtag "#DontCrackUnderPressure". Jack carefully scrutinises the ad's content rather than casually scrolling through it because he is highly motivated to buy a watch for himself. He was looking to buy a watch for quite some time. He invests his time in reading the tagline and reflecting on its meaning and at the same time admiring the watch design and its features. Jack devotes time and thought to process the Tag Heuer ad by focusing on the central elements of the ad such as watch design, features and its tagline that reflects strong mechanisms. Daniel on the other hand, who is not intrigued by watches, comes across the same Tag Heuer ad. He decides to buy the watch as it is endorsed by Chris Hemsworth who is looking attractive in the ad. Daniel did not closely process the central elements of the ad such as the watch design or its features, nor did he reflect on the tagline. Without thinking much about the ad or its content, he is persuaded by a non-substantive element such as attractiveness of the endorser.

According to ELM, their processing route was different, Jack followed the central route of processing, and Daniel followed the peripheral route of processing. These routes of persuasion are the two endpoints of a continuum in which people engage in the complete analysis and evaluation of information. People are rarely at the extreme points of this continuum, and thus they often exert some effort in forming their attitude, which involves relying on some form of central and peripheral processing strategies (Petty et al., 2005). However, it is essential to understand the processes of these two endpoints of the continuum.

The effortful elaboration of the central route of processing involves paying careful attention to the relevant information in the message, relating that information to previous knowledge stored in memory and forming new implications of the information (Petty et al., 2005). In the example mentioned above, Jack's processing of the ad was detailed and effortful. He related the ad's information (Don't Crack Under Pressure) with his knowledge (success he achieved from his hard work) to arrive at an idea (i.e. watch represents his personality) that was not present in the ad nor his knowledge.

The peripheral processing route to persuasion involves less cognitive effort where simple cues that are not central to the message help the persuasion and attitude formation. For example, Daniel's elaboration was not based on the effortful consideration of the merits of the watch or its use to him. His attitude change was based merely on the attractiveness of the endorser.

The ELM is based on the assumption about human nature in general, i.e., people do not have the motivation or ability to process everything carefully (Petty et al., 2005). It is unlikely that every message could attract sufficient interest from people and nor is it likely that every message is provided complete attention. The availability of necessary motivation and ability to direct to a central route, whereas, the lack of motivation and ability directs a peripheral route (Petty et al., 2005). The personal relevance of a message is the primary reason for people's motivation to exert cognitive effort in elaborating the message. The relevance of a message will be perceived differently by every person or will be different in certain situations. For example, the Tag Heuer ad would be relevant to people interested in buying a luxury wristwatch or someone who is not personally interested but might find it relevant as a gift for their partner.

When people do not find the message relevant to them, they do not deploy their cognitive resources and elaborate the message with the least effort. People are generally "cognitive misers" or "lazy organisms", as they do not process all the information effortfully (Taylor, 1981; McGuire, 1969; Petty et al., 2005). They tend to use shortcuts or simple cues to make a decision. For instance, people rely on the endorser to develop a positive attitude towards a brand rather than their knowledge (Lafferty and Goldsmith, 1999). An athlete endorsing sports shoes persuades people to buy the product as it unburdens them from effortfully analysing the merits of the product for them. They would rely on the perceived expertise of the athlete and develop a positive attitude towards the product. People are expected to follow the peripheral route unless they are motivated and able to process the information with high cognitive effort. Products irrelevant to a person will initiate less motivation, e.g., ceteris paribus; a running enthusiast will be more motivated to process the ad of a sports shoe brand than a natural gas supplier.

Another critical aspect of deciding the persuasion route is the message processing ability. The ability to process the message can be situational or individual. The situational ability, such as distraction, might impair the elaboration of the message as a consequence of increased cognitive load (Regan and Cheng, 1973; Kahneman, 1973). For instance, where a mobile ad for Tag Heuer is received by a person while they are watching TV. The person might be distracted by the content on TV and would not, therefore, be able to elaborate on the mobile ad of the watch brand with sufficient cognitive resources. Whereas, an individual's ability to elaborate the message would depend on their level of intelligence and also on the objective knowledge about the topic of the message (Wood et al. 1995). For example, someone with expert knowledge of watches would be more able to elaborate the Tag Heuer ad than others with a limited understanding of watches. Thus, the lack of ability, either situational or individual, is more likely to result in the peripheral processing route of persuasion.

CMA, LCM and ELM provide an in-depth understanding of the effect of media multitasking on people's cognition and behaviour. In the next section, media multitasking literature has been reviewed that applied the aforementioned theories to examine the effect on memory and attitudes.

2.3.4 Effect on Media Multitasking on Cognition

Multitasking is a situation that causes impaired cognitive processing due to divided attention between more than one task simultaneously (Rubinstein et al., 2001). The past decade has seen a significant rise in media multitasking research. The majority of those studies examined the effect of media multitasking through the lens of CMA and LCM but have also combined it with other theories (Lang and Chrzan, 2015).

Armstrong and Greenberg (1990) were one of the earliest researchers who looked at the effects of multitasking, where one of the tasks involved using media. They suggested that background TV inhibited cognitive processing (Armstrong and Greenberg, 1990). Taking Kahneman's CMA (1973) as the underlying theory, Armstrong and Greenberg (1990) tested participants on seven different cognitive tests while simultaneously asking them to watch the TV. The results suggest that people were less able to comprehend texts, solve problems and generate creative thoughts while the TV was played in the background as compared to when they were not distracted by any other media. The results of their study were aligned with the CMA, which postulated that the background TV interfered with the resources required for cognitive tests. The limited resources could not process the mental work of cognitive tests as well as process the TV information. The results of the study generalised detrimental effects on cognitive processing by measuring performance on the comprehension of the text but did not measure the memory of the text (Armstrong and Greenberg, 1990). This was redressed in another study where the memory of newspaper articles while watching TV was tested. (Armstrong et al., 1991). The results aligned with the previous study as people were less able to recall the article when they read it while watching TV as compared to when they read it in a quiet place.

In another study, the difference between the encoding and retrieval of memory while media multitasking were compared to better understand the negative effect of memory in a dual-task context (Armstrong and Chung, 2000). The authors compared the memory of a newspaper article among four conditions: (i) when it was read (encoded) with the distraction of background TV but its recall was in silence, (ii) when the reading was in silence but its recall was in the presence of the background TV, (iii) the background TV was present while both reading and recall and the same content was being played on the TV, (iv) the background TV was present while both reading and recall but different content was played while reading and recall. The results show that the detrimental effect is due to the presence of distraction during encoding (TV while reading). The recall in the presence of TV did not lead to a further reduction in memory when TV was also present during the reading. There was no significant difference in the memory if there was a difference in the content on TV between the reading and recall phase. The results support the CMA theory, which explains the inferior encoding due to capacity constraints.

The memory of the information processed while media multitasking varies according to the type of distraction. In a study, school students were compared on their performance of homework assignments when they were distracted by either TV playing a soap opera in their language or music videos foreign language or radio playing the same foreign language music (Pool et al., 2003). Their homework assignments involved paper-and-pencil and memorisation tasks. The paper and pencil task consisted of reading comprehension and corresponding multiple-choice questions. The memorisation task required students to study the map of Africa and name the countries and their capitals later on an unmarked map. The results present that students who were exposed to soap operas on TV performed poorly on their homework assignments in comparison with other students. The foreign language music on the TV or on the radio did not impair their performance. It was due to the resource-demanding content of soap operas which require more attention as compared to music videos. The changing scenes with or without audio in the soap opera are essential to understand the story, whereas the music on TV or the radio does not require a high level of attention to understand. The visual and audio cues of soap operas interfere with working memory required to process homework information, thus leaving insufficient capacity of resources needed to process the information of homework assignments (Armstrong and Sopory 1997; Pool et al., 2003).

Tasks that do not obstruct the resource requirements of the other task in a dual-task context are better performed simultaneously, for instance, texting or talking on the phone while driving is dangerous as it would lead to impaired driving, whereas playing the piano and singing together would make for an excellent performance. Similarly, information from multiple media which can be processed within the limited capacity of resources would not lead to degraded processing quality (Wickens, 2002). People are more able to perform a visual task on a computer while talking over the phone than communicating through an internet messenger on a computer (Wang et al., 2012). The distribution of audio and visual nature of the tasks reduces the performance decline during media multitasking.

The increase in cognitive effort via personal relevance has been proven to improve the processing of the message (Petty and Cacioppo, 1984; Chaiken, 1980). Petty and Cacioppo (1984) asked students to process a message about rising tuition fees in a distant university (low relevance condition). They were asked to process the same message regarding the proposal for increasing the fee in their own university (high relevance condition). The results showed that students processed the message with more cognitive effort in the high relevance condition than the low relevance condition. Srivastava (2013), in his study, expected similar results in the media multitasking context. He tested the effect of multitasking and personal relevance on memory performance in the context of message processing. He asked students to listen to an online podcast on Ohio State University's American football contest while manipulating the multitasking by asking them to read an online article simultaneously. In the single-tasking condition, the participants read the online article and listened to the podcast separately. The relevance of the online article was manipulated by varying message features such as the webpage of Ohio State University with the university logo and colours for high relevance, and Texas State University's logo and colours for low relevance. Their memory performance was tested for the online article and podcast. The results of his study aligned with the other media multitasking literature, as people who multitasked performed poorly on the memory test. In addition, high relevance did not lead to higher memory when compared with low relevance in multitasking conditions. The cognitive load of media multitasking and the limited capacity to process restricted the effect of high relevance on memory, thus high relevance of context did not enhance memory.

There have been several studies that indicate the negative effect of media multitasking on memory (Jeong and Hwang, 2016; Segijn and Eisend, 2019), which is due to the limited cognitive capacity to process information from multiple sources. The multiple tasks diminish learning and memory by increasing the cognitive load on the human brain (Mayer and Moreno, 2003; Moreno and Mayer, 1999). Media multitasking leads to a higher cognitive load, which eventually decreased the comprehension and memory of the information processed while multitasking. Taking cues from Mayer and Moreno's studies, Van Cauwenberge et al. (2014) tested the mediating role of cognitive load in the relationship between media multitasking and memory. In their study, participants were asked to watch a newscast and answer some questions on a printed questionnaire. The questionnaire was manipulated for relevance and irrelevance with the newscast. The study tested the impact of relevance/irrelevance of the secondary task on the memory of the newscast. While no statistical difference was found in the effect of relevant and irrelevant media multitasking on cognitive load, irrelevant media multitasking exerted more cognitive load than relevant media multitasking.

2.3.5 Effect of Media Multitasking on Advertising Memory

The negative effect of media multitasking is also reflected in the advertising literature. Studies have found that recall and recognition of advertisements are lower for people who multitask than people who use one media at a time (Segijn and Eisend, 2019). The effectiveness of an ad was compared between the simultaneous exposure of online and radio ads with a single-exposure of ads on each of the media (Voorveld, 2011). The results show that the recall and recognition of the ad were lower when participants were media multitasking than when they were single-tasking.

Watching TV while communicating with others via social networks, texts messages, or emails is detrimental for advertising. Bellman et al. (2014) explored the impact of social TV (a general form of combining social media with TV) on advertising effectiveness. In a controlled laboratory experiment setting, participants watched two half-hour programs that included commercial breaks. The participants were randomly assigned to either watch the TV alone (solo), with their partner (co-viewing) or watch it in separate rooms and still communicate with their partners through text messaging (social TV). The results showed that social TV is equally distracting as co-viewing as it negatively affects the processing of ads (Bellman et al., 2012). Multitasking with another device during social TV setting lead to poor recall of ads in comparison to solo viewing, which did not involve any distraction. However, the memory of ads in social TV was not significantly different from co-viewing.

Media multitasking does not just affect the memory of ads but also the content on both devices. For instance, a study explored the people's viewing behaviour while media multitasking via an eye tracker found that people performed poorly on the memory test of ad and content on TV and the secondary device when they were multitasking in comparison to when they were focussing only on one device (Segijn et al., 2017b). Participants were asked to watch a reality entertainment show (*Survivor*) on TV while using a Tablet PC to read a magazine article related to the TV show (*interviews with contestants*). The stimuli on TV and on Tablet PC included a banner advertisement which was placed at the same time on both the devices. The results of the study found that people who multitasked recalled less than than those who single tasked on questions related to the TV show, content on magazine and banners ads. The questions related to the TV show were based on the visual information (e.g., how many beds were there?), audio-visual information (e.g. which contestant made the following statements?), and audio (e.g. what was the message read by the contestants?). The questions related to the magazine article were based on the visual content (e.g., what will change in the next season?). Another important contribution of this study was that it used eye-tracking technology to measure the attention of the participants in addition to the self-reported measure used by other media multitasking studies (Angell et al., 2016; Duff and Sar, 2015; Jeong and Hwang, 2012). It was revealed that people are capable of reporting their attention on different media as the eye-tracking data of participants' attention was correlated with their self-reported attention.

2.3.5.1 Positive Effect of Media Multitasking on Advertising Memory

Although media multitasking is expected to have a negative effect on cognitive outcomes, it is not always the case. In specific contexts, media multitasking has been beneficial for cognitive outcomes like recall and recognition of the ads. One of the most significant contexts is when the tasks are related in media multitasking, e.g. when people are watching a program on TV and texting/tweeting about it simultaneously. In a ground-breaking study in media multitasking literature, Angell et al. (2016) were able to substantiate that task congruency in media multitasking improves brand recall and recognition. In their study, a student sample from different British universities completed a questionnaire on their experience of watching an international football match the night before. The football match was shown on a free to air channel, and the target sample was unaware that they would be invited to complete a questionnaire the next day on their experience of watching the match. The questionnaire was focused on capturing the media multitasking behaviour of the respondents during the game. The questions evaluated (i) congruence of their secondary activity with the primary activity (football match related/unrelated activity); (ii) the degree of social accountability [1]attributed to the secondary activity (text messages or tweets sent and read during the game), and (iii) recall of advertisements displayed on perimeter billboards during the match. The results of the study found that when primary and secondary tasks are congruent, and the secondary task entails a higher level of social accountability, then the memory of ads is bound to be higher. For instance, when a person is watching a football match and simultaneously sending text messages or tweets to his followers, her/his multitasking congruency and social accountability are high, and thus the person is likely to remember more sponsored brands from the match than the people who were multitasking in low congruency or low social accountability. It is the first study to suggest a context when media multitasking is not detrimental to advertising memory.

Building on the work of Angell et al. (2016), Segijn et al. (2017a) suggested the mechanism facilitating advertising effectiveness for related media multitasking. In their study, two separate experiments, an online study and a laboratory study, showed that people who engaged in related media multitasking performed better in the test of memory of brands than people who engaged in unrelated media multitasking. They suggested that the effect of related media multitasking on brand memory was mediated by attention and, subsequently, program involvement. In the first study, they compared single-tasking with related and unrelated multitasking. The participants watched an excerpt of a TV show (*Maestro*, a musical reality TV show) in the single-tasking condition and solved anagrams (related/unrelated to the TV show) in addition to watching TV in the multitasking

[1] Social Accountabilty refers to the extent to which people are socially accountable for what they are texting or tweeting to their friends or followers. It signifies higher level of traceability which makes people more conscious of the information they share. Sending football realted text messages or tweets is a high social acoountable acitivity in comparison to browsing the internet for football related information.

conditions. The TV show included a product placement of a lottery brand, which was tested for recall and recognition. The results showed that multitasking leads to lower attention to the TV, which resulted in lower involvement with the program and lower memory of the brand in comparison to single-tasking. Whereas, in comparison with unrelated multitasking, related multitasking leads to better brand memory via higher attention and higher program involvement. The same results were derived in the laboratory experiment, where the same TV clip was used but the secondary activity involved reading and responding to chat messages (related/unrelated to the TV show) on a tablet PC while the video was being played. The study provided an underlying mechanism for the effectiveness of advertising in related multitasking situations, which was mediated by attention to the TV and the involvement in the TV program. Previous studies also examined direct effects of multitasking on advertising memory (Angell et al., 2016; Kazakova et al., 2016), but it was the fundamental study to provide insight into how advertising works in a related media multitasking context.

The impact of media multitasking on memory is also moderated by the advertising appeals (Kazakova et al., 2016). In a two-part study, Kazakova et al. (2016), explore the effect of media multitasking on ad memory and the moderating role of advertising appeals. In the first study, they were unsuccessful in determining the role of task relevance in effecting advertising memory. The participants saw an excerpt of a travel show embedded with commercial breaks while simultaneously reading an article on a laptop that was relevant or irrelevant to the TV show content. The results show no difference in the memory of ads between the relevant and irrelevant media conditions. In the second study, participants saw a TV clip with a neutral tone of emotion embedded with a block of commercials as their primary task. The commercial block included four ads with either desirability or feasibility appeals of the same product categories. The desirability ad appeals tried to convince the consumers by providing fewer details about the product, instead referred to a high-order goal they could achieve by having the product. For instance, an ad presents a lovely car and people on the streets are so impressed by looking at it that they stop whatever they were doing and appreciate the car. Whereas, the feasibility ad appeals try to convince the consumer by providing a detailed description of the practical benefits they could achieve by having the product. For instance, a car with high fuel economy could help them save up to £1000 in a year. As a secondary task, people read an online newspaper unrelated to the TV content on a laptop. The results showed that people who watched desirability ads while media multitasking performed better at recalling and recognising the ads in comparison to the people who watched feasibility appeal ads. This study provides a rationale that desirability appeal ads ease the process of multitasking as they require less cognitive processing and thus are performed better in the test of memory.

As the ad appeal affect the processing of information, the processing style of an individual also affects the processing of information. People's processing style influences their attention while encoding information and while people have divided attention while media multitasking, the processing styles have a direct effect on the encoding of information (Kim and Humphrey, 2010). There are two types of processing styles, first, analytical processing, which focusses on specific items of a stimulus by detaching the object from the context and focusing on the attributes of the object. For example., a print ad of *Toyota Prius* presents the car in beautiful scenery with greenery in the background and clear blue sky. An analytical processor would only focus on the car detaching from the beautiful environment context and evaluating the car on its attributes visible in the ad. Second, holistic processing is an information processing style with an orientation to building a relationship between the object and the context. For example, a holistic processor would process the same *Toyota Prius* ad by building a relationship between the beautiful environment and the car and consider the car as environmental-friendly.

Duff and Sar (2015) explored the effect of processing styles (holistic vs analytical) and moods (positive vs negative) on brand recognition while media multitasking. In a two experiment study, Duff and Sar (2015) found that there was no significant effect of processing style or moods on recognition memory, but the recognition memory differed between the style of processing. For instance, the holistic processors' (peripheral processing) recognition memory did not differ between single tasks and dual-tasks. Whereas, the memory of analytical processors (central processing) significantly decreased when they multitask. The memory of holistic processors did not fall when the cognitive load of another task was added. Thus, holistic processers have a better memory of ads in media multitasking situations than analytical processors.

2.3.6 Effect of Media Multitasking on Affective Outcomes of Advertising

The results of media multitasking in relation to affective outcomes (e.g. attitude or purchase intention) are less conflicting than the results on cognitive outcomes. Most of the studies find a positive effect of media multitasking on attitude towards advertised brands (Jeong and Hwang, 2016; Segijn et al., 2019). The reasons provided for this effect are either attributed to limited cognitive capacity theories (Kahneman, 1973; Lang, 2000) or ELM (Petty and Cacioppo, 1986). Kazakova et al. (2016) and Segijn et al. (2019) have based their results on limited cognitive capacities arguing that people have limited cognitive resources to resist a persuasive message when they are multitasking and are thus more likely to have a positive attitude than people single-tasking. According to ELM based studies, media multitaskers tend to process information through peripheral processing, which results in less attention towards and comprehension of a message and reduced counterarguing of weak messages. (Jeong and Hwang, 2016).

Yoon et al. (2011), in their study test the cognitive load between media multitaskers and single-taskers and its effect on consumer's attitude towards brand placement in films. People in the single-tasking condition watched stimuli videos with brand placement without any additional task. Participants in the media multitasking condition were asked to remember and repeat eight numbers while watching the stimuli video with brand placement to simulate cognitive load. The study also compared two different kinds of brand placements, well-integrated placements (e.g. aligned with the storyline) and intrusive placements (abrupt display with no connection with the story). For example, *FedEx* placement in the movie *Runaway Bride* was seamless and well-integrated as the FedEx brand was used to help the Bride run away from her wedding and another actor commenting ‘where ever she is going, she will be there by 10:30 in the morning tomorrow’ (emphasising on FedEx's overnight shipping proficiency). Whereas, in the movie *The Thomas Crown Affair,* an actor abruptly marches to a vending machine, pulls out a *Pepsi* can and guzzles it down with no contextual connection with the story. Yoon et al. (2011) argue that well-integrated placements involve cognitive elaboration from the viewer, unlike the intrusive placement. Both kinds of placements have different effects on viewers evaluation. The well-integrated placements resulted in a favourable attitude towards the brand, whereas intrusive placements have a negative effect on the brand when they are viewed without any distraction (Gupta and Gould 1997; Yang and Roskos-Ewoldsen, 2007). The results of Yoon et al.’s (2011) study aligned with previous findings for single-taskers but in the case of media multitasking, well-integrated brand placements had a dampened effect on brand attitude, and the negative effect of intrusive placement on brand attitude was mitigated. The effects were attributed to the cognitive load of media multitasking which inhibited cognitive elaboration and diminished the elaboration-driven brand-plot integration effect and minimised the unfavourable reactance towards the intrusive placement.

The effect of multitasking on persuasion can vary depending on the outcome of the message, whether it is information comprehension or information acceptance (Jeong and Hwang, 2012). For instance, a car ad presenting detailed information about the new technology used in the car, which requires comprehension by the receiver would be less persuasive in multitasking context, in comparison to an advertisement that presents a simple argument that its product is better than other competitors. It is because multitasking reduces the attention required to comprehend the first ad and suppresses the counterarguing required for the second ad. An experimental study examined the multitasking effects on the persuasion of messages focussed on the social issues in Korea (Freedom of expression online, River restoration projects, wartime operational control) (Jeong and Hwang, 2012). Participants' comprehension and the counterarguing ability for the social issue messages were tested between media multitasking and single-tasking conditions. The results showed that multitasking reduces comprehension and at the same time, also reduces the counterarguing ability. Reduction incomprehension would lead to poor understanding of the message and eventually inhibit persuasion, whereas reduced counter ability could at the same time increase persuasion as people have fewer resources to evaluate and reason the argument with a different opinion. Thus, media multitasking facilitates and inhibits persuasive messages at the same time.

The effects of persuasion are not just dependent on the outcome of the message but also on modalities of tasks. For example, when the primary task is to process an ad in a newspaper (which involves using visual resources to see the ad), and the secondary task also demands visual attention (watching TV), the processing of information and subsequent persuasion is bound to suffer because of the same resources required for processing information from different soruces (Kahneman, 1973; Lang, 200). Whereas if the secondary task is audio-only (listening to the radio), then the persuasion will not be impaired (Wang et al., 2012). Jeong and Hwang (2015) conducted a two-part study to compare the modalities of multiple tasks. Their findings suggest that if there is an overlap in the modalities of multiple tasks, such as multiple tasks demanding the same resources, then the comprehension and counterarguing are reduced. For example, while reading the newspaper and simultaneously listening to music is less harmful to persuasion than reading a newspaper and watching TV. The reason for the inhibiting role of media multitasking in persuasion is due to the structural interface, which involves two or more information sources occupying the same sensory channel, e.g. ear-audio, eye-visual (Bolls and Muehling, 2007).

In addition to facilitating and inhibiting persuasion, media multitasking also results in positive ad evaluation of ads, task enjoyment and perception of time passing quickly. People enjoy media multitasking and have a positive evaluation of ads than when single-tasking (Chinchanachokchai et al., 2015). Chinchanachakchai et al. (2015) in their study compared single-tasking with two task and three task conditions to examine the relationship between ad evaluation and perception of time passing while media multitasking. Participants evaluated unfamiliar foreign ads in the single-tasking condition while in the media multitasking conditions, participants performed visual and motor tasks. In the two-task condition, participants monitored the letters 'x' and 'z' and were required to type them respectively, as they appeared on the screen. In the three task condition, the participants did an additional task of pressing '.' when a black circle appeared. The results showed that multitaskers perceived time to pass more quickly than single taskers, and they enjoyed the tasks more in comparison to single-taskers. Media multitasking also resulted in more positive ad evaluation, and this effect was mediated by the perception of how quickly time was passing. The results of this study suggest that as people think time is passing rapidly while media multitasking, they enjoy multitasking and have a positive attitude towards the ads processed during media multitasking. Chinchanachakchai et al. (2015) argue that as multitaskers are left with fewer resources to realise that the time is passing quickly, it enhances their positive overall experience of media multitasking which eventually results in the positive evaluation of ads.

Due to the limited capacity model (Lang, 2000) and the role of concurrent modalities, (e.g. both visual) examined by Jeong and Hwang (2015), the effects of media multitasking on persuasive advertising are better understood. For a more in-depth understanding of media multitasking effects, the underlying role of recognition, counterarguing and enjoyment was tested by Segijn et al. (2016). In a laboratory experiment, Segijn et al. (2016) tested the mediating role of recognition, counterarguing and enjoyment on advertising effectiveness in terms of evaluative outcomes (i.e., brand attitude, message attitude, and purchase intention). The authors proposed that media multitasking would decrease the counterarguing and increase the enjoyment of people and would have a positive effect on each of the evaluative outcomes. Whereas, media multitasking would increase people's difficulty in recognising advertised brands and would result in adverse evaluative outcomes. The participants were randomly assigned to one of four media conditions; (i) multi-screening condition, in which participants watched TV and used a tablet, (ii) sequential tasking, in which participants watched the TV first and then used the tablet, (iii) Single TV tasking, in which participants only watched the TV and (iv), Single Tablet tasking, in which participants only used the tablet. The participants watched a block of commercials on TV, which had eight filler ads and one target ad, and used the tablet to browse a TV guide with a banner advertisement of the same target brand.

The results showed that media multitasking, as expected, decreased the recognition of the brand and led to poor evaluative outcomes. In contrast, a decrease in the counterarguing lead to better evaluative outcomes. Interestingly, the enjoyment of media multitasking did not result in a significant effect on any of the evaluative outcomes. The results of enjoyment contradict the findings of Chinchanchakchai et al. (2015), which suggested enjoyment mediated the effect of media multitasking on positive ad evaluation.

Segijn et al. (2016) were the first to present recognition and counterarguing as the underlying mechanism for the effect of media multitasking on evaluative outcomes. However, they suggest that both of these mechanisms are exclusive in nature and may not apply to every media multitasking situation. Counterarguing which entails thoughtful elaboration, is minimised during media multitasking due to the capacity interface. Counterarguing imposes the additional burden of cognitive processing, incapable of thorough elaboration as a consequence of limited cognitive capacity (Lang, 2000). The capacity interface is present in all forms of media multitasking, as they all increase the cognitive load. In contrast, recognition is related to the structural interface, which is based on the task structure or resources required for each task. Difficulty in recognising an ad depends on the quality of encoding and storing of information which can be enhanced by attention to the ad. In the Segijn et al. (2016) experiment, the difficulty in recognition was attributed to the inability to provide attention to both the screens as they used the same modality (visual) and required the same resources. Thus, the participants were not able to encode and store information due to lack of attention, which resulted in poor evaluative outcomes. Difficulty in recognition would not have a negative effect on evaluative outcomes when the modalities are different as participants would not have to share the same resources between the tasks (Jeong and Hwang, 2015). For instance, reading an ad in a newspaper while listening to the radio will not create a conflict in resource requirements as to process information from newspaper requires visual attention and for radio, listening resources are required. Table 2.2 provides a summary of media multitasking studies that have focused on the effects on advertising outcomes.

Table 2.2: Summary of Prior Studies on the Effect of Media Multitasking on Advertising Effectiveness

Authors	Context	Primary Media/ Task	Secondary Media/Task	Dependent Variable (DV)		Effect on DV
				Cognitive	Affective	
Voorveld (2011)	The effect of using the internet and radio on advertising	Internet (Banner Ads)	Radio (Radio Ads)	Yes Recall	No	Media multitasking has a negative effect on the recall of both internet and radio ads.
Yoon et al. (2011)	The effect of well-integrated vs intrusive brand placement on brand attitude	TV (Brand placement)	None (Memory task)	No	Yes Brand Attitude	Media multitasking dampens the positive effect of well-integrated placement on brand attitude, whereas, it mitigates the negative effect of intrusive placement on brand attitude.
Jeong and Hwang (2012)	The effect of media multitasking on comprehension and counter arguing	Print (Social issue article)	TV (Movie)	Yes Comprehension	Yes Counter arguing	Media multitasking reduces comprehension and counterarguing.
Jeong and Hwang (2015)	The effect of structural interference on persuasion.	Newspaper (Ad)	Radio/TV (audio Ad/Visual ad)	Yes Comprehension	Yes Counter arguing	Structural interference in media multitasking reduced both comprehension and counter arguing.

Duff and Sar (2015)	The role of holistic and analytical processing on the memory of ads	Simulating TV on one window of the computer screen (Commercials)	Simulating task on another window of the computer screen (Hitting slash and backslash keys)	Yes Recogniti on and Recollect ion	No	Effect of media multitasking on memory is moderated by processing style. Holistic processors better recall the ads while multitasking than single-taskers.
Chinchanachokchai et al. (2015)	The effect of time perception, enjoyment, and ad evaluation	Simulating TV on one window of the computer screen (Commercials)	Simulating task on another window of the computer screen (Hitting slash and backslash keys)	No	Yes (Ad evaluation)	While media multitasking people evaluate the ads positively, this effect is mediated by the perception of time passing quickly.
Angell et al. (2016)	The role of congruence between the media and social accountability of secondary activity on the memory of sponsors	Live TV (Sponsored Billboard)	Mobile (texting/tweeting)	Yes Recall and Recogniti on		People remember the sponsored brand more when the secondary activity is congruent to the primary activity and has social accountability.
Segijn et al. (2016)	Examining the underlying mechanism of the effect of multi-screening on evaluative outcomes	TV (Commercial)	Tablet (Banner ad)	No	Yes Brand Attitude	Media multitasking led to poor evaluation of the brand via poor recognition. In comparison, a decrease in counterarguing led to a higher evaluation of the brand.

					Message Attitude	
Kazakova et al. (2016)	The moderating role of desirability and feasibility of ad appeals on the effect of media multitasking on brand memory and brand attitude	TV (Commercial)	Laptop (Browsing News website)	Yes Recall	Yes Perceived Intrusiveness	While media multitasking, ads with desirability appeal were better recalled than feasibility appeal ads. The ad appeal did not have an effect on perceived intrusiveness while media multitasking.
Segijn et al., (2017)	The effect of relatedness between tasks on brand memory and brand attitude	TV (Product Placement)	Tablet (Text Messages)	Yes Recall and Recogniti on	Yes Brand Attitude	Related multitasking resulted in better memory and attitude towards brand via higher attention and program involvement.
Segijn et al. (2017a)	The effect of multi screening with TV and Tablet on attention and memory of ads and content on media	TV (Banner Ad)	Table (Banner Ad)	Yes Recall and Recogniti on	No	Media multitasking resulted in poor memory of content and the ads on both the media.

2.4 Research Gaps and Hypothesis Development

One of the main objectives of advertising is to trigger the purchase of the advertised product or service (Kotler and Armstong, 2017). Earlier, there was a time lag between the exposure of the ad and the opportunity to purchase the advertised product or service. Now with the growing usage of internet enabled mobile devices and the wide usage of different media devices simultaneously, this time lag is reduced, which has led to immediate online shopping behaviour after being exposed to an ad on either device (Liaukonyte et al., 2015). However, irrespective of the time difference, advertising effectiveness is dependent upon the consumer memory of the ad at the point of purchase (Keller, 1987; Liaukonyte et al., 2015).

This thesis examines the role of consumer memory for advertising, emphasising the media multitasking environment and factors that interact with it to affect the memory of ads. Most of the media multitasking literature suggests that ad memory is poor during media multitasking due to the limited capacity to process information (Jeong and Hwang, 2016; Segijn and Eisend, 2019). Whereas, other studies suggest media multitasking is effective in enhancing the memory of ads during media multitasking if the ads are related to media multitasking activities (Segijn et al., 2017), and the secondary activity has social accountability (Angell et al., 2016). The processing style of consumers and advertising appeals also influence the memory of ads during media multitasking (Duff and Sar, 2015; Kazakova et al., 2016).

In contrast, the media multitasking studies exploring the affective outcomes of advertising are less contradictory. Most of the studies suggest that media multitasking results in a positive attitude towards the ads and brands (Kazakova et al., 2016; Jeong and Hwang, 2012) but some did not find a significant effect of media multitasking on affective outcomes (Segijn et al., 2017; Segijn et al., 2016). To the best of the researcher's knowledge, there are not many studies that provided substantial results confirming the negative effect of media multitasking on brand attitude (Jeong and Hwang, 2016). The underpinning theories of the studies mentioned above explain the positive effect of advertising through less counterarguing and ELM (Jeong and Hwang, 2016). The reasons for the non-significant effect have not received much attention, but there is a naïve explanation that decreased recognition leads to lower attitude towards the advertised brands (Segijn et al., 2016, Bornstein D'Agasto, 1992).

Although the effect of media multitasking on cognitive and affective outcomes are contrary, their underlying theories are consistent. Both effects could be explained through cognitive capacity theories or ELM. The media multitasking literature is inconsistent regarding its effect on advertising outcomes, and thus this thesis attempts to contribute to media multitasking literature by testing the memory of ads in three separate studies to provide more reliable support. The studies test the effectiveness of different forms of advertising during media multitasking in each of the three studies; TV adverts in a block in Study 1, perimeter boards and shirt sponsorship in football in Study 2, and product placement in a TV show in Study 3.

2.4.1 Study 1: High Multitasking vs Low Multitasking: The effect of media multitasking on advertising effectiveness

According to the limited cognitive capacity theories, there are finite cognitive resources available at a given time to enable information processing (Kahneman, 1973; Lang, 2000). If the primary task demands a high level of cognitive resources, then only a small amount of attentional resources are available to process information from a secondary source (Bang and Wojdynski, 2016). Task performance in media multitasking is dependent on the availability of an individual's cognitive capacity (Gilbert et al., 1988). The amount of cognitive resources allocated to a particular task may vary depending on the difficulty of the task (Gwizdka, 2010). For instance, watching TV as a primary task that involves processing audio and visual information is more resource-demanding than listening to the radio as the primary task, which involves only processing audio information. People listening to the radio are more likely to pay attention to and completely process information from a secondary source (e.g. mobile device) compared to those who are watching TV.

The elaboration of an ad message is an effortful process that requires a considerable amount of cognitive resources (DeRosia, 2008). When a person is media multitasking, their cognitive resources are employed in processing information from multiple sources and are often not sufficient to process information from each source completely. It is primarily when the multiple tasks demand a high amount of resources or require the same resources (Jeong and Hwang, 2015). In certain situations, some tasks demand more resources than others and due to the limited capacity of resources, the availability of resources for the secondary tasks decreases (Gwizdka, 2010). The limited availability of resources during media multitasking results in the impaired evaluation of ad messages. The first study of this thesis attempts to confirm the previous findings of media multitasking literature by testing the negative effect on the memory and positive effect on evaluation. Hence, the first and second hypothesis is presented:

Hypothesis 1: Media multitasking negatively affects the memory of the ads as compared to single-tasking.

Hypothesis 2: Media multitasking positively affects the attitude towards the brand as compared to single-tasking.

American Psychology Association's Dictionary of Psychology defines *cognitive load* as the relative demand imposed by each task in terms of cognitive resources required (VandenBos, 2015). Media multitasking exerts a cognitive load on individuals, which results in a negative effect on memory and a positive effect on evaluative outcomes. As the cognitive load increases, the performance on cognitive tasks decreases as a consequence of the limited resource capacity. In contrast, studies in the field of cognitive psychology that focussed on the effects of cognitive load on memory conclude that higher cognitive load reduces the effect of distractions caused by secondary tasks (Park et al., 2007; Minamoto, 2015). They suggest that as the cognitive load increases, there are fewer attentional resources needed to process distraction information and thus, working memory capacity is enhanced. Thus, a higher cognitive load would result in better processing of information than a low cognitive load. The attenuating effect of high cognitive load on distractions is achieved in the above-mentioned studies in the special circumstance when the cognitive load and distractor share similar characteristics.

Most of the media multitasking studies have compared the cognitive load between singe-tasks and dual-tasks (Jeong and Hwang, 2016). There is one particular study that compared single-tasking with two-task and three-task multitasking in their effect on ad evaluation (Chinchanachakchai et al., 2015). The results of their study confirmed that an increase in the cognitive load increased the evaluation of the ads. People performing three tasks at the same time had a higher evaluation of ads than those performing two tasks or a single task. Chinchanachakchai et al. (2015) compared the cognitive load between two and three task conditions that were performed on the same screen, but in study 1 of this thesis compares multitasking by manipulating the intensity of cognitive load between two different screens. Chinchanachakchai et al.'s (2015) study only compared the evaluative outcomes (ad evaluation), which only presents the half picture of the advertising outcomes. Study 1 addresses this weakness and tests the cognitive outcomes in addition to the evaluative outcomes. Thus, study 1 compares the cognitive load between two media multitasking conditions and their effects on memory of ads and attitude towards the ads.

The cognitive load of media multitasking has been reported as the reason for the effect on advertising outcomes and it is suggested that increasing the cognitive load further would result in stronger effects (Jeong and Hwang, 2015; Voorveld, 2011; Zhang et al., 2010). Hence, the third and fourth hypothesis is:

Hypothesis 3: High cognitive load (high media multitasking) negatively affects the memory of the ads as compared to low cognitive load (low media multitasking).

Hypothesis 4: High cognitive load (high media multitasking) positively affects the attitude towards the brand as compared to low cognitive load (low media multitasking).

2.4.2 Study 2:
The Role of Difficulty in Advertising Effectiveness while Media Multitasking.

The ability to perform multiple tasks simultaneously is one of the essential aspects of media multitasking. The significant amount of cognitive or physical effort required to perform those tasks defines the difficulty of tasks (Chae et al., 2015). The difficult tasks require a higher level of cognitive or physical effort or a combination of both than a non-difficult task. It is also substantiated that a higher level of effort leads to a high level of performance unless the task is impossible or extremely difficult (Brehm et al. 1983). However, it is not possible to match the demands of increasing difficulty in performing multiple tasks as there is a limited capacity of both cognitive and physical effort. For instance, it is difficult to provide cognitive effort in processing information from a news broadcast on TV while watching NetFlix on a tablet PC, and it would be physically difficult to divide vision between two screens at the same time. It will be further difficult both cognitively and physically if an additional smartphone is accessed to scroll the social media feed while multitasking between TV and a laptop.

Difficulty in performing tasks has been measured in media multitasking literature to evaluate cognitive effort or a combination of cognitive and physical effort. Van Cauwenberge et al. (2014) in their study, manipulated media multitasking by asking participants to watch a newscast and simultaneously browse the internet to look up information to find answers to a set of questions provided to them. Participants' perceived difficulty following and understanding the news stories in the newscast was measured to assess the cognitive load. As expected, the results of the study showed that participants found it difficult to follow and understand the news as it was cognitively difficult for them in comparison to single-tasking. Multitasking was performed on the same device by splitting the screen into two halves. One half displayed the newscast, while the other half showed the homepage of a search engine to look up for the information. The physical effort of looking up information while watching the newscast was not measured. In another study, participants watched a block of TV commercials in one quadrant of the computer screen while simultaneously monitoring another quadrant for the appearance of "x/z" and pressing the respective alphabets on the keyboard (Duff and Sar, 2015). The perceived difficulty to perform the overall tasks was measured between single task, two-task and three tasks (Duff and Sar, 2015). The difficulty to perform the tasks was highest when participants performed three tasks, while it was least when they performed only one task—the difficulty of performing the tasks was significantly different among the three tasks condition as the subsequent increase in tasks led to an increase in the perception of difficulty. In a similar study, perception of the difficulty of performing multiple tasks was compared between one, two and three task conditions (Chinchanachokchai et al., 2015). The results were also similar, as an increase in the number of tasks led to a higher perception of difficulty in performing the tasks. Duff and Sar (2015) and Chinchanachakchoi et al. (2015) did not consider the difference in the physical and cognitive effort in performing the multiple tasks as they measured the combined overall effort. The studies mentioned above have all measured difficulty of performing tasks on a single screen. This study tests the effect of multitasking with two different media (TV and smartphone) and expects similar results. Thus, the fifth hypothesis of this research is proposed:

H5: Media multitasking is perceived to be *more difficult* than watching a single screen.

The difference in difficulty in performing multiple tasks is not solely dependent on the number of tasks but also the resources demanded by each task. The difficulty in performing tasks is either because there is a limited cognitive capacity and multiple tasks compete for cognitive resources or due to the resource demand of each, which may be the same or different. For example, watching a reality show on TV and, at the same time watching a music video on a smartphone will require high cognitive resources to process information from both devices. The resource demand for both tasks is the same as requiring visual and audio resources to process information. Whereas, reading a book while listening to the radio would not be as disruptive to information processing as simultaneously watching TV and watching videos on a smartphone as they both require different resources, audio for the radio and visuals for reading the book. Tasks that compete for the same cognitive resources and inhibit information processes have a capacity interface such as, whereas tasks that occupy the same sensory channels have a structural interface. Most of the media multitasking literature focussed on the capacity interface (Voorveld, 2011; Bellman et al., 2012, Jeong and Hwang, 2016)

In a two-part study, Jeong and Hwang (2015) examine the role of the structural interface in media multitasking and its effect on persuasion. In the first study, they compared the capacity and structural interface by asking participants to read a printed text while listening to the radio (capacity interface) or watch TV adverts (structural interface). The results showed that the structural interface is detrimental to persuasion as it reduces comprehension and counterarguing in comparison to the capacity interface. This is because cognitive resources required in capacity interface multitasking is within the mental capacity, whereas looking at two screens at the same time is beyond the physical ability of individuals. The participants were more persuaded when they listened to the radio while reading the text than when they watched TV adverts. In the second study, they compared the content of the structural interface by including verbal and non-verbal secondary tasks. The participants were asked to read the same printed text in the first study while either listening to music (lyrical vs instrumental), watching music video without audio (with subtitle texts vs no subtitle text), or watching the music video (with subtitles vs instrumental). The results showed that a high content secondary task such as music with lyrics or with subtitles is more distracting than low content secondary task such as music without lyrics or music without subtitles. The higher content of the secondary task made the structural interface stronger and its negative effect on persuasion robust. Jeong and Hwang's (2015) study was the first to focus on the structural interface in media multitasking and provided results that disregard the assumption made by other media multitasking studies that the effects are only due to capacity interface.

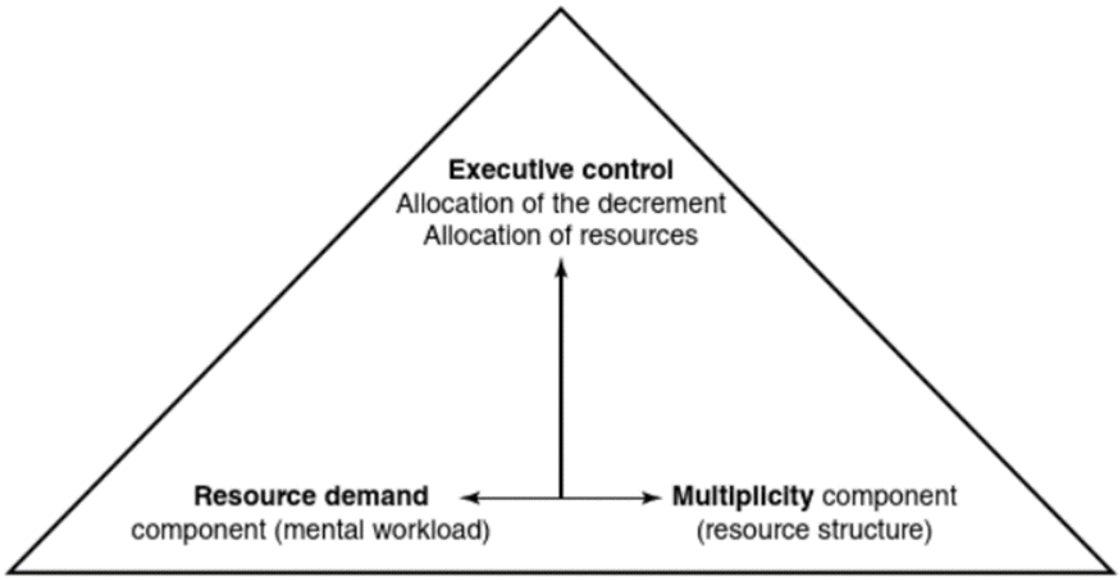
Media multitasking literature shows a homogeneity in their underpinning theories to demonstrate its effect on cognitive and affective outcomes of advertising. The majority of the studies examined the advertising effects through the lens of limited cognitive capacity models (Jeong and Hwang, 2016; Segijn and Eisend, 2019). The primary reason for homogeneity is due to the emphasis being only on the capacity interface during media multitasking. Indulging in media multitasking involves not only cognitive effort but also physical effort, for instance, people performing physically effortful tasks while being exposed to two different media, e.g. watching a TV screen and listening to podcast on a smartphone while running on a treadmill. In the ever-busy lifestyle of present times, there are different combinations of tasks that are performed simultaneously. Different task combinations while media multitasking requires different resources, which eventually have different effects (Jeong and Hwang, 2016). Multiple resource theory (MRT) by Wickens (2002) provides a relevant concept of resource demand in dual-task and its effect on information processing and performance on tasks. This study unwraps the task difficulty concept in media multitasking by carefully examining the physical difficulty aspect of media multitasking. MRT is the underpinning theory used in the second study to understand the role of physical effort and cognitive effort required in media multitasking.

2.4.2.1 Multiple Resource Theory

Kahneman (1973) and Lang (2000) state that a human brain has a limited capacity of resources for processing information and simultaneously doing two tasks demands more resources than one task performed individually, which results in the supply of less than demanded resources to each task and eventually, this deficit of resources results in deterioration of performance in one or both the tasks (Wickens, 1991). This deterioration of task performance is known as dual-task decrement, and the reasons for this decrement have been the focal point of multitasking literature over the years (James, 1890; Titchner, 1908; Wicken, 1976; Damos, 1991).

According to Wickens et al. (2016), three general mechanisms of human performance are responsible for variability in dual-task decrement: (a) the resource (effort) demands of a task related to its difficulty, (b) the similarity between two tasks in their demand for multiple resources and (c) the relative priority is given to one task or the other. These three mechanisms are termed resource demand, resource multiplicity and executive control, respectively and are part of the *Multiple Resource Theory.*

Figure 2.11: Wicken's Architecture of Multiple Resource Theory



The resource demand mechanism causes divided attention in multitasking, which is determined by the difficulty of the resource demands of each task. People can perform two easy tasks simultaneously, such as walking and talking; and if the difficulty of one or both the task increases the performance on the other task is compromised. For example, while walking steep uphill roads or explaining a complex concept, the tasks have become difficult and now compete for resources, and one or the other may not have sufficient resources for performance at its single task level (Wicken, 2016).

The multiplicity mechanism emphasises that the human brain does not possess just one pool of resources for which the tasks compete equally. There are multiple resources required to perform a task. For instance, visual and motor skills are required to walk. Similarly, texting on a smartphone also requires visual and motor skills; but texting while walking will be more effortful than doing each task individually. The decrement is greater when two tasks require the same resources than when they demand separate resources. In this case, both tasks require visual resources but different motor resources. Keeping eyes only on one task will reduce performance on the other, whereas using hands for texting and legs for walking have different resource demands.

The performance in multitasking is determined by resource demand and resource multiplicity. However, resource allocation is the most vital mechanism as it decides which task suffers more when there is a dual-task decrement. Executive control allocates resources by prioritising tasks and controlling the performance of each task by dividing the decrement between the tasks. For example, while walking and texting, executive control will decide when to look on the road and when to look at the screen, and when to prioritise texting by stop walking or when to cross the road and stop texting.

The multiple resource theory is based on the mechanisms mentioned above, and the decrement in performing multiple tasks is subject to shared resources required for each task. The greater extent of distinction in the resource requirement of each task, the less dual-task decrement is expected. For example, listening to songs while walking or jogging leads to minimum decrement, as both the tasks require entirely different resources.

Therefore, two tasks that require different resources are easily performed than tasks that require the same resources.

Building on the work of Jeong and Hwang (2015), this study tests the type of difficulty experienced in media multitasking. The perception of difficulty experienced during media multitasking can be in terms of physical difficulty or cognitive difficulty (Rosenbaum et al., 2001; Kool et al., 2010). The difference in the pool of resources required to perform the physically and cognitively difficult tasks; combining them would be less detrimental. Jeong and Hwang (2015) found different effects of structural and capacity interface in media multitasking. Their study compared the effect on persuasion by measuring comprehension and counterargument of a printed text while multitasking. This study tests the physical and cognitive difficulty's effect on advertising memory during media multitasking. As media multitasking is cognitively difficult, combining physically effortful tasks with it would draw resources from a different pool of resources and would not further decrement the task performance. Thus, the following hypothesises are proposed:

H6: Media Multitasking will be negatively related to advertising memory.

H7: Difficulty mediates the effect of media multitasking on advertising memory.

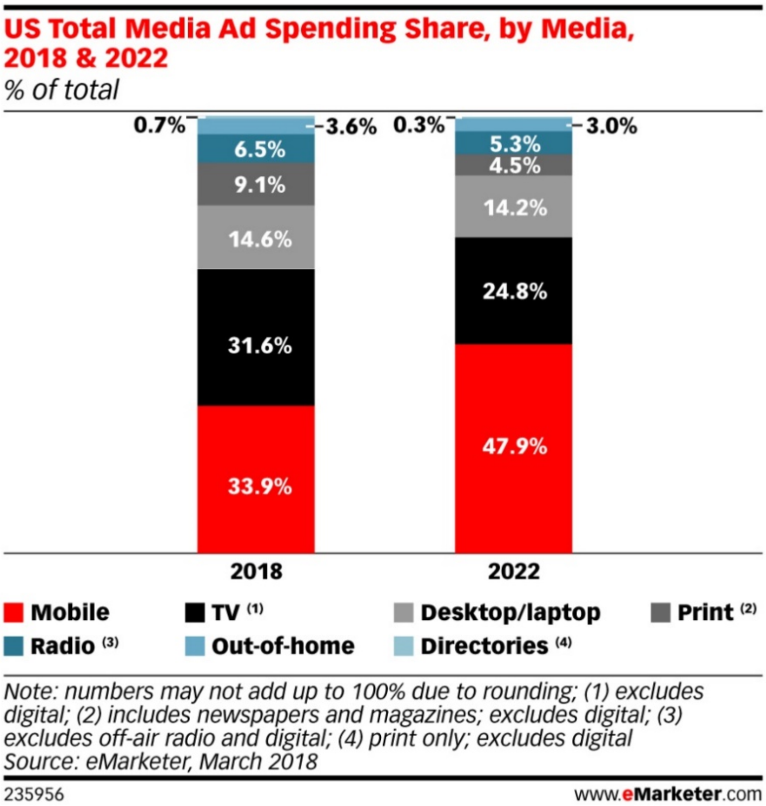
H8: Physically difficult media multitasking will have a positive effect on advertising memory.

H9: Cognitively difficult media multitasking will have a negative effect on advertising memory.

2.4.3 Study 3: The Effect of Synchronised Advertising on Brand Memory and Brand Attitude and its Underlying Mechanism

After focusing on the role of cognitive load and task difficulty in advertising effectiveness during media multitasking, study 3 focuses on the relationship between content on media while multitasking. A large part of media multitasking literature is concentrated on the effectiveness of ads appearing only on one media, i.e. TV (Angell et al., 2016; Segijn et al., 2016; Kazakova et al., 2016). The extensive use of mobile devices on their own or while using with another media creates myriad opportunities for placing an ad on it. Mobile advertising is increasing at an astonishing rate as it accounts for more than 70% of total digital spending and almost one-third of the total ad spend in the developed world, see figure 2.12 (eMarketer, 2018). One of the new advertising opportunities for marketers that has evolved from the consumption of multiple media at the same time is *Synced Advertising*, which enables marketers to advertise individually target messages based on people's current media usage (Segijn, 2019). For example, people receive Heineken ads on the social media feed they are scrolling through on their mobile device at the same time as they are watching a Heineken sponsored football match on TV.

Figure 2.12: Total Media Ad Spending in US, Source:emarketer (2018)



Synced advertising a data-driven target ad sent to individuals based on their media behaviour, such as website visits. The major difference between synced advertising and other data-driven advertising strategies (online behavioural ads), is that target ads are based on the individual's current media usage rather than past media usage (Segijn, 2019). Online behavioural ads are based on past website usage or past purchases, whereas synced ads are based on the TV or mobile content an individual is consuming in real-time.

Synced advertising is a relatively new field of study in advertising literature, but it is closely related to concepts of online behavioural ad, cross-media advertising and mobile advertising. There are only a few studies that have explored the synced advertising effect, and one of them is a study by Segijn and Voorveld (2020) that explored its effect on brand attitude. This study proceeds a step further by testing its effect on memory as well as proposing the underlying mechanism of its effect.

This study proposes that synced ads would result in better memory of ads and a positive attitude towards the advertised brands. There are two possible explanations for this effect; (a) increased chance of exposure and (b) repeated exposure. In the increased chance of exposure explanation, synced ads would be more effective than ads placed on single because media multitasking leads to divided attention between the two media (Wang et al., 2012; Segijn et al., 2017a), and with divided attention, the effectiveness of processing information from one medium is difficult (Jeong and Hwang, 2015). However, with divided attention, it does not matter which medium an individual is directing their attention towards; and an individual would process the ad from either media. For example, instead of a genuine coin with head and tail, synced ads provide a two-headed coin that guarantees getting the desired result (exposure to the ad). Media multitasking literature posits that information processing is impaired when people use two or more media at the same time (Jeong and Hwang, 2016; Segijn and Eisend, 2019). However, Segijn et al.'s (2017b) research that compared attention between media in a multitasking study suggests that information processing is only impaired for the medium that receives less attention. During synced ads, the message will be processed from either medium, irrespective of which media an individual is paying more attention. Thus, in synced advertising, the information processing of the ads is highly likely.

According to the repeated exposure explanation, exposure to a message from two different sources enhances the evaluation of the message. It is due to the multiple source effect, which states that a similar message received by an individual from two different sources is perceived as more credible and positive (Harkins and Petty, 1981). In the case of synced ads, the two different media are two different sources. Thus, receiving ads from two different media results in higher credibility and positive evaluation of the message. This has been applicable in the cross-media studies where people being exposed to a combination of TV ads and online ads evaluated the advertised brand more positively than people who were exposed to an ad from a single medium (Chang and Thorson, 2005; Voorveld et al., 2011). The multiple source effect also suggests that its effects would be more pronounced when the multiple ads are similar rather than the same (Harkins and Petty, 1981). For instance, the ads convey the same message through different versions rather than exact repetition.

The repetition would also positively affect cognitive responses such as recall and recognition. When advertising messages of a brand are repeated on two media, they are encoded in the memory with two different contexts (Harkins and Petty, 1981). These effects are robust when the repeated message is a different version rather than the exact copy of the first message. The repetition with a slight variation increases the associations in the memory traces, which facilitating the retrieval from memory. The different contexts act as the retrieval cues in the memory and a higher number of retrieval cues of a particular message are easier to recall than fewer retrieval cues (Tavassoli, 1998). Thus, the following hypothesis is proposed:

H10a: Synced advertising will result in positive cognitive responses (brand memory) than non-synced advertising.

H10b: Synced advertising will result in positive affective responses (brand attitude) than non-synced advertising

2.4.3.1 Mediation of Processing Fluency

The outcomes of information processing are not only influenced by the content of the information and the processing environment but also by the subjective perception of information processing (Wänke and Hansen, 2015). For instance, prior exposure to a stimulus makes it easier to process at a later time (Bornstein and D'Agostino 1992, 1994). This familiarity with the stimulus encourages a subjective perception of processing fluency (Janiszewski and Meyvis, 2001). Similarly, an advertisement that has been exposed before triggers a hedonically positive experience of fluent processing (Reber et al., 2004; Landwehr et al., 2017). In particular, feeling of ease or fluency in processing information has an impact on the cognitive and affective outcomes of processing information (Wanke and Hansen, 2015; Alter and Oppenheimer, 2009). Stimuli that are processed fluently are favourably received (Lee and Labroo, 2004) and better recalled and recognised (Jacoby and Dallas, 1981; Lanska et al., 2014). Lee and Labroo (2004) explain in their study that as the processing fluency increases, the evaluation of the target products increases. Across three experiments, higher processing fluency resulted in a favourable attitude towards advertised products (Lee and Labroo, 2004). Lanska et al. (2014), in their study, test the memory of words presented to the participants either in a processing fluent condition or non-fluent condition. The results show that words, when primed with prior exposure, were more fluently processed and were easily recognised.

In addition to explaining the effect of processing fluency, Lee and Labroo (2004) and Lanska et al. (2014) also differentiate and examine the effect of two different types of processing fluency; perceptual and conceptual. Perceptual fluency is achieved by increasing the ease with which people are able to perceive or identify the target stimuli (Alter and Oppenheimer, 2009). This identification is based on repeated exposure and processing of physical features and modalities, e.g. processing fluency achieved by identifying Nike's swoosh logo or Apple's 'bitten apple logo. Conceptual fluency can be achieved by increasing the ease of exposing them to semantically related concepts. It reflects the processing fluency with which a target comes to the consumer's mind and relates to the processing of meanings (Lee and Labroo, 2004, Jacoby and Dallas, 1981; Hamann, 1990), e.g. Looking at Nike's logo or mention of Nike brand, sports goods and apparels come to consumer's mind, or with Apple's mention or its logo, technology-related concepts come to consumer's mind. Perceptual fluency can also be achieved by printing text of stimuli in easy to read font and size (Reber and Zupanek, 2002; Simmons and Nelson, 2006), increasing the contrast of the target stimuli for better visibility (Reber and Schwarz, 1999), increasing the duration of visibility of the target stimuli (Winkielm and Cacioppo, 2001). Conceptual fluency, on the other hand, is achieved by priming with the related context before the exposure of the target stimuli. For example, Lanska et al. (2014) and Whittlesea (1993) semantically primed their participants to think about certain concepts; they showed that an incomplete sentence led to a particular expectation such as "stormy seas tossed the [boat]" made the related concept more fluent than an incomplete sentence like "he saved up his money to buy a [boat].

Lee and Labroo (2004), in their study manipulated perceptual fluency and conceptual fluency to evaluate their effect on brand evaluation. They manipulated fluency by showing the participants a storyline with four pictures and later ask them to evaluate a target brand. In the perceptual fluency condition, the participants are exposed to a ketchup bottle in the final picture to prime the perception of the ketchup brand (target stimuli). In the conceptual condition, participants are primed with a storyline of a boy going to a fast-food restaurant to have a hamburger with the final picture of mayonnaise. The expectation of seeing mayonnaise instead of ketchup in the fast-food restraint created conceptual fluency. The effect of both perceptual and conceptual fluency resulted in a positive evaluation of the ketchup brand.

Processing fluency arises as a by-product of a wide array of cognitive responses, including perceptual and conceptual processing but is not limited to them. There are many other cognitive processes such as linguistic processing (difficult to pronounce words, foreign words), imagery processing (easy to imagine situations), and embodied cognition (facial expressions, body language) that are part of the general subjective experience of processing fluency (Alter and Oppenheimer, 2009). The spectrum of processing fluency is wide, with each of its metacognitive processes having different origins, but their effect on memory and evaluation is the same (Schwarz, 2004). Many researchers have manipulated processing fluency using different cognitive processes such as semantic priming (Beggs et al., 1992), visual clarity (Reber and Schwarz, 1999), phonological priming (McGlone and Tofighbakhsh, 2000) have found identical results (Alter and Oppenheimer, 2009). As the effects of different forms of processing fluency are similar on cognitive and evaluative outcomes, this study will focus on the uniform term of processing fluency rather than a particular cognitive process.

Previous studies have established that prior exposure to a stimulus predisposes a person toward the stimulus when it is seen at a later time (Zajonc, 1968; Bornstien, 1989). It has been termed as the mere exposure effect, which states that people develop likeness towards things merely because they are familiar with them (Janeszewski, 1993). Researchers in consumer behaviour studies have shown that repeated exposure to words, slogans, images increase positive feelings towards these stimuli (Bornstein, 1989; Janiszewski and Meyvis, 2001). The processing fluency model provides the explanation of this mere exposure effect. It states that prior exposure to the stimulus makes it easier to perceive, encode and process, which generates a positive feeling. When people evaluate the stimulus, they often misattribute the positive feeling of processing fluency for liking for the stimulus (Whittlesea, 1993).

The positive feeling of processing fluency has also facilitated the evaluation of advertised brands (Labroo and Lee, 2006; Labroo et al., 2008; Shen et al., 2010). In a study, consumer's evaluation of an advertised product was examined by comparing the regulatory goals between target and priming stimuli (Labroo and Lee, 2006). The effect of regulatory goals on fluency was tested by manipulating the regulatory goal of the target ad and the priming ad, i.e., prevention goal vs promotion goal. The regulatory goal of ads presents a particular attitudinal and behavioural stance of the advertiser. For instance, prevention focussed regulatory goal conveys a message of regulating consumer's attitudes and behaviours toward the pursuit of safety and security, whereas promotion focussed regulatory goal regulates consumer's attitudes and behaviours toward the pursuit of advancement and growth. For example, a hair shampoo brand promoting with a regulatory goal might use the tagline "Eliminate Lice completely", whereas the same brand with a promotion goal might use the tagline "making your hair soft, smooth and beautiful." The results of Labroo and Lee's study (2006) showed that when the regulatory goal of the priming stimuli and the target stimuli are the same, the processing fluency of the target ad is high, which results in a higher evaluation of the target brand. The processing fluency also mediates the effect of regulatory goal compatibility on brand evaluation.

Labroo et al. (2008), in their study, found that the semantic priming of visual identifiers (animal pictures and logos) increases affective responses via an increase in processing fluency. The study showed that even if the priming of a visual identifier does not have a logical link with the target stimuli, it resulted in favourable evaluation and preference to buy the product. For e.g. an individual with a young daughter or a son who loves Peppa Pig is constantly primed by Pig images, and this reflects in the evaluation and purchase of unrelated products depicting pig images. Labroo and her colleagues in their experiment asked the participants to visualise a particular word (frog or a control word) and were later exposed to images of wine bottles with labels having pictures unrelated to wine (e.g., hippo, cycle, frog). The results of the study showed that priming by visualisation of an unrelated word and later exposure to the image of the priming word resulted in higher processing fluency. The processing fluency also mediates the effect of priming on the attitude towards the wine brand. These results are in line with the earlier studies that demonstrated the effect of processing fluency on brand attitude (Lee and Labroo, 2004; Reber et al., 2004).

Synced advertising involves exposure of the ad of the same brand on two different media at the same time. In this study, synced advertising are tested in the form of product placement on TV and banner ads on mobile. The exposure to both forms of ads is simultaneous but the processing of the ads would likely be sequential as the exposure to product placement is for a longer duration than the exposure to the banner ad. The TV ad would be visible even after the banner ad has been delivered on the mobile. Considering the repeated exposure assumption, the ad on either device could be processed before the other and would act as the priming exposure. The later exposure of the ad on a smartphone would increase the processing of the synced ads and would result in a higher attitude towards the advertised brand. Thus, processing fluency would mediate the effect of synced ads on brand attitude.

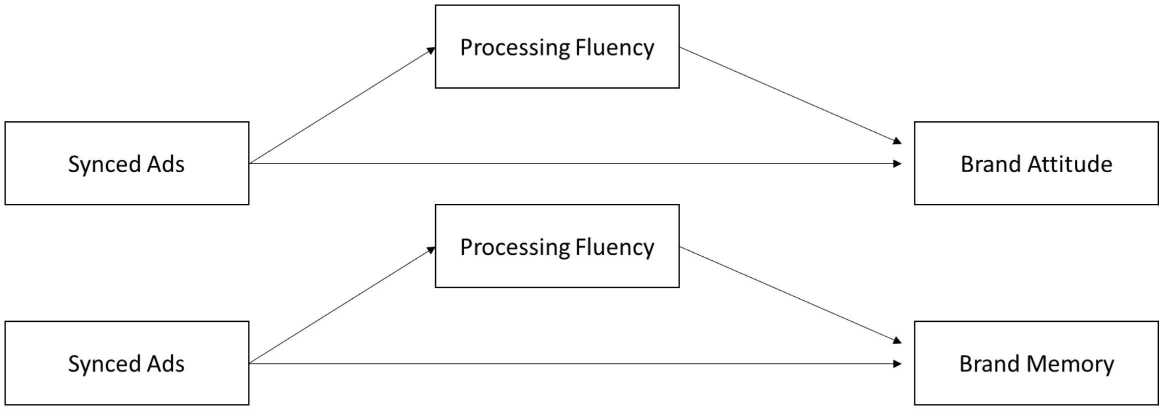
H11: People who receive synced ads will have better processing fluency and will, therefore, have a better attitude towards the advertised brands than the people who do not receive synced ads.

The effect of processing fluency on cognitive outcomes is not extensively studied in consumer behaviour studies but has been well-researched in psychology studies (Whittlesea, 2002; Kurilla and Westerman, 2008, Lanksa et al., 2014). The numerous studies devoted to understanding the process of recognition memory have revealed *familiarity* as one of the important predictors of memory (Westerman et al., 2002). Fluent stimuli are perceived as more familiar than non-fluent stimuli on recognition tests (Lanska et al., 2008). The familiarity to a stimulus is a function of the degree to which stimulus matches previously stored memory; the higher level of matches leads to a higher level of familiarity (Westerman et al., 2002). For example, people are familiar with their hometown because they have particular memories related to different areas of the town. Over time, more incidents occurred in different areas, and more memories were created, leading to more familiarity. However, a fabricated sense of familiarity can be manipulated regardless of the match between familiarity and long term stored memory. A subjective feeling of familiarity is achieved with the ease of processing, which results in higher recall on memory tests (Jacoby and Whitehouse, 1989). People are more willing to guess and assume they are familiar with the stimuli on memory tests when it is fluently processed as compared to less fluently processed stimuli (Kurilla and Westerman, 2008; Whittlesea et al., 1990).

During synced advertising, the exposure of the stimuli ad would also be repeated across two different media simultaneously, and it is expected that it would result in higher processing fluency. Processing fluency has been attributed to enhancing memory when stimuli are presented in repetition; thus, processing fluency is expected to mediate the effect of synced advertising on brand memory. Therefore, the following hypothesis is proposed.

H12: People who receive synced ads will have better processing fluency and will, therefore, have a better memory of the advertised brands than the people who do not receive synced ads.

Figure 2.13: The Effect of Synced Ads on Brand Attitude and Brand Memory



2.4.3.2 The Moderating Role of Privacy Concern

Sync ads are a digital advertising strategy that uses data gathering and data mining technologies to deliver ads based on consumers' current media usage. The personalisation of sync ads is more than any other form of digital ads as they target consumers based on the content they are consuming on other media devices (Segijn, 2019). Advertisers broadly use three major methods to target consumers to deliver synced ads; tracking hashtags on social media (e.g. Twitter/Instagram/Facebook/Snapchat), advanced segmentation techniques, and commercial watermarking (ZIGT, 2015). First, advertisers track social media hashtags to deliver ads synced with the media content consumed on other devices. When people post pictures/stories or tweet on social media with hashtags about a show, it is likely that they are watching the show. For example, when people share information on social media by hashtagging the team name or tournament, e.g. #MUFC, #UEFA, about a football match that is being telecast live, they provide tracking data to advertisers to deliver synced ads. Second, advanced segmentation techniques are based on an individual's personal characteristics such as demographics, psychographics, lifestyle characteristics that advertisers use to predict whether a person is watching a show or not (Segijn, 2019). For example, an ad for the new BMW model was delivered on the mobile device of a middle-aged British male during the telecast of BBC TopGear. The probability of the individual watching the show is high as the show is particularly popular among 30-60-year-old British male audiences (Johnson, 2020), and the digital footprints of the person provide data that he is looking up information to buy a new car. Advertisers applying advanced segmentation techniques would deliver the ad on the individual's mobile device as he fits in the segment of the target audience. Third, commercial watermarking is used by placing a sound (watermark) within an ad that can be picked up by the mobile device to track the content on the TV. By installing certain mobile apps, people give consent to the device to listen to their surroundings and collect data. When these apps recognise the watermark, they immediately know when to deliver the synced ad.

Synced ads are delivered using the personal data of consumers, either knowingly or unknowingly, and people are now more concerned about their data usage (Auxier et al., 2019). Thus, it is important to address the concept of privacy concern, which is defined by Beak and Morimoto (2012, p.63) as " the degree to which a consumer is worried about the potential invasion of the right to prevent the disclosure of personal information to others." Several research studies have revealed that people are concerned about the misuse of their personal information by data collecting companies and advertisers (Phelps et al., 2000; TRUSTe, 2012, Smit et al., 2014). People do not have a strong opinion towards synced ads as it is a relatively new phenomenon and requires substantial research. However, similar data-driven ads such as online behavioural ads and personalised ads have been negatively evaluated by the consumers (Phelps et al., 2000; Chellapa and Sin, 2005; Huang and Li, 2016).

People who receive personalised ads on email can avoid further emails by unsubscribing themselves or provide incomplete information on websites to avoid future emails. Similarly, people also download adblocking software/plugins on their browsers to avoid targeted ads or reject, block or accept only certain types of cookies on websites that collect information (McDonald and Cranor, 2010). Although privacy concern does not stop people from posting pictures or putting hashtags on social media, they have a negative attitude towards data-driven ads (Jeong and Coyle, 2014). People find data-driven ads useful and have a positive attitude towards them when they are relevant to them and offer them good deals (Huang and Li, 2016).

Most of the studies that examined the effect of privacy concern on advertising focussed on attitudinal outcomes and avoided cognitive outcomes such as memory and attention (Jung, 2017). In this study, this limitation was addressed, and it is expected that privacy concern has a positive effect on memory and attention. According to the limited capacity model (Lang, 2000), the automatic selection process of encoding directs the attentional resources immediately towards unexpected occurrences such as concerns/threats. Greater cognitive resources are allocated towards the unforeseen concern to manage the concern. It is expected that when people have a higher privacy concern while media multitasking, a higher level of attention would be given to the source of the privacy concern. Thus, it is expected that privacy concerns would interfere with the processing fluency of the synced ads. Therefore following hypothesis is proposed:

H13: The mechanism via which synced ads increases brand memory and brand attitude by increasing the processing fluency is based on an individual's privacy concern.

Specifically, the effect of synced ads on processing fluency is stronger for individuals with high privacy concerns.

2.4.3.3 Moderating Role of Source Attractiveness

Most of the advertising literature examining the effect of the message sources on persuasion and memory has primarily focussed on source credibility (Chaiken,1980; Tormala et al., 2007; Briñol and Petty, 2008; Hovland et al., 1953; Chaiken and Maheswaran, 1994). Although studied less, source attractiveness is a vital component of message source, and it is also a significant determinant of persuasion (Mello et al., 2020; DeBono and Harnish, 1988; Pucket et al., 1983). Source attractiveness is generally referred to as the physical attractiveness of the source of the message, e.g. the perceived attractiveness of Bar Rafaeli, a supermodel, endorsing the watch brand Hublot.

Figure 2.14: Bar Rafaeli endorsing Hublot Watches

It is well established that attractive individuals in advertisements influence a brand's recall, attitude and purchase intention (Kahle and Homer, 1985). The reason for this effect can be understood from the match-up hypothesis, which suggests that the endorsers are more effective in achieving advertising objectives when there is a fit between the endorser and the endorsed product (Kahle, 1984; Kahle and Timmer, 1983; Till and Busler, 2000). Physical attractiveness is highly effective for the products which are used to enhance one's attractiveness; for example, grooming products like razors and shampoos (Kohle and Homer, 1985). When a stunningly attractive person claims to use a stylish product, that product is assumed to be the reason for their attraction.

Another explanation for the effect of physical attractiveness on advertising effectiveness is that attractive endorsers lure people into an advertisement by increasing their arousal state and narrowing their attention (Easterbrook, 1959; Kahle and Homer, 1985). Arousal, which is defined as the level of alertness or activation on a continuum ranging from extreme drowsiness to extreme wakefulness (Duffy, 1962; Humphreys and Revelle, 1984). The attractive models exude sensuality and increase arousal, which has a substantial positive effect on information processing (Sanbonmatsu and Kardes, 1988). However, high arousal levels are detrimental to information processing particularly when the task requires a high level of cognition (Zajonc, 1965). For example, the negative effect of arousal on information processing is observed in dual-task situations which require more cognitive resources to process information (Eysenck, 1982). Eysenck (1982) in his multitasking study, manipulated the arousal levels and found that people performed poorly on secondary task under high arousal, whereas the performance on the primary task was usually unaffected. A high arousal state makes the automatic nervous system intense, which requires more cognitive resources; the increase in demand for cognitive resources compromises the supply to non-priority tasks, such as the secondary tasks in a dual-task situation. The attentional resources are directed to the primary task not as an inevitable consequence but as a coping strategy to deal with the limited capacity of resources imposed by the arousal state (Eysenck, 1982; Sanbonmatsu and Kardes, 1988).

It is evident that any variable that restricts the information processing capacity also restricts the opportunity to process information. Several variables such as involvement (Batra and Ray, 1986 Petty et al., 1983), need for cognition (Cacioppo et al., 1986), and distraction (Petty et al., 1976) have been found to moderate the processing ability of a message. The synced ads ease the processing of ads in the high cognitive load environment created by media multitasking. Source attractiveness which is arousal generating cue draws more cognitive resources and diminishes the processing fluency achieved through synced ads. The attractive people used in ads are expected to draw attention to one media while disrupting the processing of ads on other media, therefore reducing the synced ads effect on processing fluency. In this study, the synced ads are presented on TV and mobile using product placement on the TV show and digital banner ads on a smartphone. The product placements on the TV includes young, attractive males and females in swimming trunks and bikinis using the promoted product. Therefore it is expected that the effect of synced ads on processing fluency would be moderated by source attraction. Thus, the following hypothesis is proposed:

H14: The mechanism via which synced ads increases the brand memory and brand attitude by increasing the processing fluency is based on the individual's perception of the attractiveness of the celebrity endorser. Specifically, the effect of synced ads on processing fluency is weaker for individuals with a higher perception of the endorser's attractiveness.

2.5 Summary

The present chapter applied, Capacity Model of Attention, Limited Capacity Model and Elaboration Likelihood Model and took insights from the media multitasking literature to present four hypotheses that propose the difference between high media multitasking and low media multitasking for the first study. For the second study, multiple resource theory was used as an underpinning theory to propose four hypotheses to compare cognitively difficult media multitasking and physically difficult media multitasking. An understanding of synced advertising, privacy concern, source attractiveness and multiple source effect resulted in five hypotheses for the third study. The subsequent three chapters test the thirteen research hypotheses in three separate studies. The next chapter tests the first of the thirteen research hypotheses.

CHAPTER THREE STUDY 1: COMPARING LOW MEDIA MULTITASKING WITH HIGH MEDIA MULTITASKING IN THEIR EFFECT ON ADVERTISING OUTCOMES

3.1 Overview

Performing more than one task at a given time is not merely a choice but has become a requirement of present-day living for many people. At any given point, a person might be involved in two tasks simultaneously, such as reading emails while talking over the phone or listening to music while browsing on their smartphones. Media multitasking has been under the microscope of scientists and social scientists for some years, specifically those interested in understanding the mechanisms that facilitate and inhibit human multitasking capacity (Broeker, et al., 2017).

Technology has now become an essential part of our daily lives and also forms a central part of most multitasking activities (Ofcom, 2017). The majority of people in the UK have access to a variety of devices such as television, smartphones, tablets and laptops in their homes (Ofcom, 2017). These devices are the main sources of media consumption. For instance, smartphone ownership amongst British adults is at 85%, albeit predominantly greater amongst adults aged below 65 years (Deloitte, 2017). Smartphones are by far the most used devices and are the preferred choice for going online as opposed to computers (Ofcom, 2017). After smartphones, the most accessible device, used by 70% of the adult population in the UK, is the television (Ofcom, 2017). With the increased access to all these devices in UK homes, the usage of these devices overlaps at certain times. Sometimes the use of more than one device is inevitable while sometimes accessing one over the other is a matter of choice. The combined use of multiple devices to access media content simultaneously is known as media multitasking (Voorveld et al., 2014). Media multitasking can be performed by undertaking two tasks simultaneously or by rapidly switching back and forth between the two tasks (Lang & Chrzan, 2015).

Almost every adult in the UK indulges in media multitasking at some point during the week. Adults spend at least two hours daily indulging in media multitasking (Beeftink, 2019). The most common form of media multitasking is watching and communicating, which is closely followed by watching and reading/browsing/using. It is reported that at least half of the time spent using phones, laptops and tablets is combined with another activity. Media multitasking is most common among younger adults who spend one-third of their time on multiple devices consuming media (Ofcom, 2015).

According to the Ofcom report on media multitasking (2015), there is no difference between men and women who media multitask, but there is a difference between people who are working and those who are non-working. The people who are working combine the use of different media more than those who are not working. Working people spend less time watching only the television as compared to non-working people. Among the media devices, people spend more time watching television without any secondary task, specifically live television. Considering the visual nature of all the media devices and limited visual capacity, it is almost impossible for people to completely engage in two or more devices at the same time (Kahneman, 1973; Baddeley, 1997). This forces people to divide and switch their visual attention between the multiple devices (Brasel and Gips, 2011; Jeong and Fishbein, 2007). This divide of attention while media multitasking has effects on cognitive and attitudinal outcomes.

In this study, the effect of media multitasking is tested in the cognitive and attitudinal outcomes of advertising. Single-tasking will be compared with two different levels of media multitasking, low media multitasking (LLMT) and high media multitasking (HMMT). Using Capacity Acceptance Model (Kahnemann, 1973) and Limited capacity Model (Lang, 2000) as the theoretical underpinnings, this study proposes testing previous media multitasking literature. CAM and LCM collectively state media multitasking increases the cognitive load on individuals which inhibits their processing of information from both tasks because there are limited resources available to process information. The limited availability to process information during media multitasking results in poor processing of information. This poor processing of information results in lower memory and higher evaluation of information. Previous media multitasking studies that have focussed on advertising outcomes have demonstrated that media multitasking results in poor memory of advertisements and a higher attitude towards those advertisements (Jeong and Hwang, 2016, Duff and Sar, 2015). Some studies have also found higher memory and lower attitude towards the advertised brands while media multitasking (Angell et al., 2016; Segijn et al., 2017; Segijn and Eisend, 2019). This study proposes testing the previous media multitasking findings and conclusions on the effects of media multitasking on advertising effects. It is proposed that media multitasking results in lower memory of advertisements and higher attitude as compared to single-tasking. This study also proposes that as the level of media multitasking increases, the above-mentioned effects are amplified. Table 3.1 summarises the hypothesis of this study.

Table 3.1: Summary of Hypothesis for Study 1

	Independent Variable	Dependent Variable	Hypothesis	Model
H1	Media Multitasking	Brand Memory	Media multitasking negatively affects the memory of the ads as compared to single-tasking.	t-test
H2	Media Multitasking	Brand Attitude	Media multitasking positively affects the attitude towards the brand as compared to single-tasking.	t-test
H3	Media Multitasking	Brand Memory	High cognitive load (high media multitasking) negatively affects the memory of the ads as compared to low cognitive load (low media multitasking).	ANOVA
H4	Media Multitasking	Brand Attitude	High cognitive load (high media multitasking) positively affects the attitude towards the brand as compared to low cognitive load (low media multitasking).	ANOVA

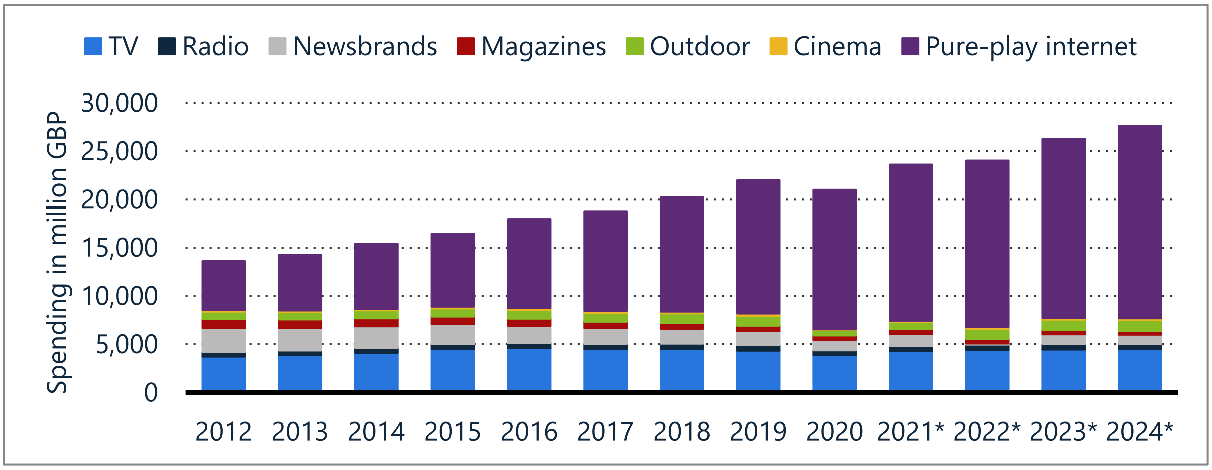
The objective of the study is to test and confirm the previous media multitasking findings in the advertising context and to compare the advertising effects on varied cognitive load (low media multitasking vs high media multitasking). To achieve the objective and to test the above-mentioned hypothesis, a laboratory experiment was conducted at the University of Plymouth. Single-tasking was compared with low media multitasking and high media multitasking to examine the effects of media multitasking. People in the single-tasking were shown a video block of international advertisements on a laptop screen, and their memory and attitude towards the advertisements were measured. People in the low media multitasking conditions were asked to watch the same video block on the laptop screen with an addition of a pen and paper task, where they were asked to spot six-letter text in the video block and write them down on a sheet of paper. People in the high media multitasking condition were asked to watch the same video block on the laptop screen and also to watch a video on a television. To manipulate high media multitasking, they were asked to spot the six-letter words in the videos on both screens. The advertising effects of all three conditions were compared by measuring brand memory and brand attitude.

In the next section, the stimulus, research setting and the procedure of the laboratory experiment are discussed. In the subsequent sections, the results of the study are analysed and presented and this is followed by the conclusion of this study. In the conclusion section, the results are summarised, and the scope for the next study is identified.

3.2 Pre-test

The objectives of this study are two-fold. The first objective is to compare different cognitive loads in media multitasking and their effect on brand memory and brand attitude and the second objective are to substantiate past literature results. This study compares the cognitive load of single-tasking, low media multitasking and high media multitasking and their effect on advertising outcomes. More than 83% of people in the UK use other media such as a mobile or a tablet while watching television (Ofcom, 2015). Television commercials are the most affected by this growing media multitasking behaviour as people are more likely to multitask when television advertisements are shown rather than during the programme telecast (Bellman et al., 2010; Bellman et al., 2012). Television advertising spending was the highest in comparison to other media until recently but with the growth in digital media usage, its total share has shrunk (Guttmann, 2021). Internet advertising will be approximately two-thirds of the total advertising spend of £23 Billion in 2021. However, this would not diminish the media consumption over the television as the spending on television advertising in the coming years is not expected to fall, see Figure 3.1 (Guttmann, 2021). Television viewing is still expected to be prevalent, mostly in combination with other media and thus, it is important to study the effectiveness of television advertising while media multitasking. Therefore, this study will use television advertisements as the stimulus for measuring advertising effectiveness while media multitasking.

Figure 3.1: Advertising spending in the UK by different mediums



Source: Statista, 2020

A pre-test was conducted to identify television advertisements of brands that were unfamiliar to the target sample as familiarity of advertisements and brands influences the information processing and message elaboration (Chang and Thorson, 2004; Celci and Olson, 1988). Similarly, saliency was also tested as it is important for the brands to be clearly visible because saliency will be diminished in media multitasking (Segijn et al., 2017b). If the brand is not salient in single-tasking, it will be more difficult to identify the brand in media multitasking (Jin et al., 2008). The target sample for this study consisted of students of the University of Plymouth. University students are considered a convenient sample but they are also a prospective target market group for the future who will watch more television (Kapferer, 1998; Hauck and Stanforth, 2007). Students, in general, are homogenous in terms of their age, intelligence and financial situation, which will control the effects of studies for important variables such as media multitasking and cognitive load. In the next section, the stimulus selection and its development are discussed.

3.2.1 Stimulus Development

The objective of the study was to look at the effectiveness of television advertisements while media multitasking by controlling for familiarity. Advertisements from outside the UK were selected to control familiarity with the UK sample. A pool of advertisements from the nominee list of the Spike Asia awards of 2015 was selected to maintain the quality of stimuli (Duff and Sar, 2015). Spike Asia awards are considered the leading awards for brilliant, creative and effective advertisements in Asia (Lionscreativity, 2020). It is one of the oldest awards for advertisements in the region (Spike Asia, 2020). All the nine advertisements from the nominee list of branded content and entertainment category were selected for the stimulus development. Table 3.2 presents the selected advertisements and their details for the stimuli. A video file was created by embedding all the selected advertisements as the stimuli for the pre-test. The total duration of the video block was six minutes and five seconds. The selected advertisements were tested for familiarity, saliency and brand attitude in the pre-test to identify the most salient and non-familiar advertisements for which the target stimuli has a neutral attitude.

Table 3.2: Details of Advertisements selected for the Pre-Test

Brand Name	Product Category	Ad Duration (mm:ss)
Downy	Liquid Detergent	1:10
ManuLife Retirement	Insurance	0:30
KrungSri First Choice	Debit Card	0:30
Snack Jack	Crisps/ Snacks	0:30
Gulf Bank	Banking	1:00
Borjan	Footwear/Apparel	0:40
Tiger Air	Airline	0:40
Britannia	Biscuits/Snacks	0:35
Rexona	Deodorant	0:30

3.2.2 Pre-test participants and Characteristics

The University of Plymouth was the research setting of this pre-test as well as the main experiment as the researcher is enrolled with the University and it facilitates the use of a laboratory and equipment needed for conducting a controlled experiment. The University of Plymouth is based in Plymouth, a city in the southwest of England with a large population of resident students. People aged 18 or above with the ability to view a computer screen normally or with corrected vision were invited to participate in the study. Participants were invited through posters, which were placed in the library and cafes. Seven male and thirteen female university students aged 18 and above were recruited to participate in the pre-test. All the students were from the UK and had never lived in any South East Asia or Middle East countries.

3.2.3 Method and Design

The pre-test was conducted at a laboratory in the University using a comfortable armchair and computer screen. The armchair was placed in front of a table on which a laptop computer was placed. The participants were asked to sit in the armchair facing the laptop. The participants were provided with an informed consent form to complete before the start of the experiment. After completing the consent form, the participants were given instructions for the pre-test. They were asked to watch the block of television advertisements, paying them their complete attention. The television advertisements were played without sound to ensure the brand perception was only visual in nature. After watching the block of television advertisements, the participants completed an online questionnaire. The questions were in the following order: filter questions, attention, brand familiarity, brand memory, brand attitude and demographic questions.

3.2.4 Pre-test Measures

Filter questions: The first question asked participants about their familiarity with South East Asia and Middle East countries and cultures. The participants were asked, ‘Have you ever lived in any Asian or Middle Eastern country. This question was intended to eliminate the possibility of familiarity or using the stimuli brands.

Attention was measured using a single item Likert scale from 1 paying no attention to the screen and 7 paying a high level of attention to the screen.

Brand familiarity: The next question was asked in order to eliminate the possibility of previous exposure to the stimuli. The participants were asked, 'Have you ever seen any of the advertisements before from the video clip you just saw?' The participants could respond Yes or No to the question. Familiarity with any of the television advertisements included in the stimuli required the participants to answer 'Yes'.

Brand Memory: The memory of the advertised brand was calculated by using the sum of scores on recall and recognition using two questions. First, participants were asked to write as many product categories and brands they recalled from the video they had just seen. In the second question, they were asked if they could remember an advertisement from the target product categories, e.g. 'Do you remember an advertisement for a Bank'. For each right answer on the memory question, the participants scored a 1 and if they remembered it incorrectly they scored a 0 (Segijn et al., 2017).

Brand Attitude: Participants reported their attitude towards the target brands using a 7-point semantic differential scale, with the endpoints of the scale being (i) Bad/Good, (ii) Unappealing/Appealing and (iii) Unattractive/Attractive. These scales were taken from Chand and Thorson's (2004) research and they have also been successfully used in other advertising research studies (Segijn et al., 2016; Voorveld et al., 2011).

Demographic questions: Finally, the participants reported their age, gender and educational qualifications.

3.2.5 Results

The pre-test successfully identified salient and non-salient brands from the different advertisements in the video stimuli. The results are from the twenty respondents from the University of Plymouth who watched the video with complete attention and completed the questionnaire. None of the respondents had ever lived in any Southern Asian or Middle Eastern countries or was familiar with any of the target advertisements. All the participants attentively watched the stimuli on the screen [$\bar{X}$= 5.75(1.07)].

The sample's age range was from 18 years to 36 years ([$\bar{X}$= 22.65(4.02)]. There were seven undergraduates, ten Masters and three PhD students in the sample. There was no influence of age on the brand memory and brand attitude scores as there was no correlation between age and brand memory (p =.345) and brand attitude (p =.575), nor was there any significant difference between genders in brand memory (p =.435) and brand attitude (p =.972). Different educational levels also did not influence the scores of brand memory (p =.711) and brand attitude (p =.546).

The brand memory and brand attitude mean scores and standard deviation of different advertisements are presented in Table 3.3

Table 3.3: Brand Memory and Brand Attitude Scores of Pre-test Ads

Brand Name	Brand Memory	Brand Attitude
Downy	3.40 (.99)	2.10 (1.55)
ManuLife	1.20 (1.04)	1.35 (1.25)
KrungSri	1.35 (1.27)	1.55 (1.16)
Snack Jack	3.30 (1.08)	1.85 (1.03)
Gulf Bank	3.55 (1.09)	2.20 (1.36)
Borjan	2.35 (1.33)	2.05 (1.55)
Tiger Air	3.55 (1.09)	2.55 (1.27)
Britannia	2.75 (1.35)	1.75 (1.65)
Rexona	3.05 (1.19)	2.05 (1.57)

The advertisements with high brand memory and neutral brand attitude were selected as the stimuli for the main study. Brands that simulate high positive or negative attitudes have a stronger effect on the memory as compared to a neutral attitude towards the brand (Alter and Kamins, 1995; Kardes et al., 1993). Reviewing the high brand memory and neutral brand attitude resulted in selecting five brands as the stimuli for the main study. The highlighted brand names were selected as the target brands for the stimuli of the main study.

3.2.6 Summary of the Pre-test

The pre-test was successful in identifying appropriate advertisements for the main study. The advertisements and the brands were completely unfamiliar to the sample as they had not previously lived in the countries where these advertisements were broadcast. Five advertisements with high saliency and neutral attitude were selected as the sample for the main study. Demographic variables such as age, gender and education did not influence the brand memory and brand attitude of the advertisements. These results provide appropriate stimuli to test the research hypothesis for the main study.

3.3 Study 1

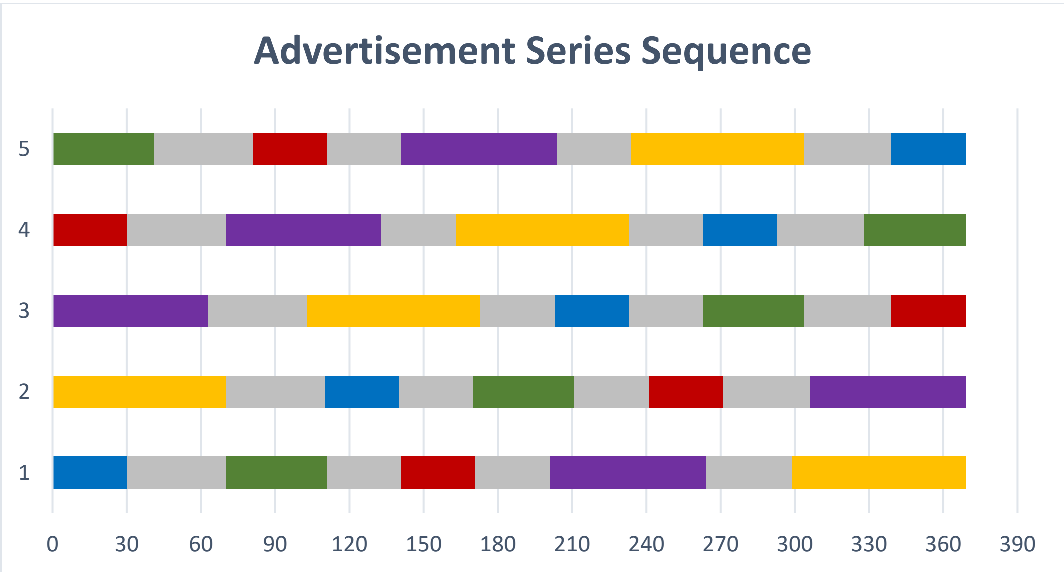
This is the first experiment of this research and it aimed to test the past research findings of media multitasking on advertising outcomes such as brand memory and brand attitude. I also compared the effect of different cognitive loads in media multitasking on brand memory and brand attitude. This experiment used acclaimed international advertisements from South East Asia and the Middle East to test advertising effectiveness in the UK by controlling familiarity with the brands and advertisements. The media multitasking was manipulated with a pen and paper task and the cognitive load of media multitasking was manipulated with the use of two screens and a high-intensity paper and pen task. In the next section, the stimuli for the study are discussed.

3.3.1 Stimuli

The experiment consisted of three different conditions, single-tasking, low media multitasking and high media multitasking. The stimuli for all three conditions was the same, which consisted of awarded and acclaimed advertisements from South East Asia and the Middle East to ensure product quality. A video block was made, which consisted of five target advertisements and four non-target advertisements, which were used as fillers between the target advertisements. The filler advertisements were chosen from the same pool of pre-tested advertisements to maintain the quality of the stimuli video. The total length of the video block was 6 minutes and 5 seconds. The sequence of target advertisements was randomised to avoid recency and primacy effects. Thus five different randomised video blocks were created where each targeted advertisement came in 5 different sequences. Thus every target advertisement comes first, second, third, fourth and last. The filler advertisements/non-target advertisements were positioned the same in the sequence in all randomised videos. Figure 3.2 provides details of the target advertisements and their sequence in the different video blocks.

Figure 3.2: Details Target Ads and Timeline and position of Target Ads in Different Video Blocks.

Colour Code	Brand Advertisement	Advertisement Detail	Duration
	Gulf Bank	Target	1:03
	Borjan	Filler	0:40
	Rexona	Target	0:30
	Manulife Retirement	Filler	0:30
	Downy	Target	1:10
	Krungri First Choice	Filler	0:30
	Tiger Air	Target	0:41
	Brittania	Filler	0:35
	Snack Jack	Target	0:30



To manipulate media multitasking and the cognitive load in media multitasking conditions a pen and paper task was used. In the low media multitasking condition, two six-letter words were embedded in the stimuli video to manipulate media multitasking.

As a secondary task, the participants were asked to write the words on a sheet of paper as soon as they are shown on the screen. Random neutral valence six-letter words were selected from the Affective Norms for English Words by Bradley and Lang (1999a). These words were placed over the non-target advertisements for the non-partial encoding of target advertisements. The words appeared for five seconds. The words and their timing differed as the target advertisements sequence changed in different video blocks. Table 3.4 presents details of the words and their timing in the video block and Figure 3.3 provides details of the sequence of words in the video blocks.

Table 3.4: Details and Timing of Words used in the LMMT condition

Video	Word 1 (Time)	Word 2 (Time)
5	WRITER (2:00)	PATENT (3:55)
4	WRITER (2:30)	PATENT (4:20)
3	WRITER (1:45)	PATENT (4:10)
2	WRITER (1:50)	PATENT (4:10)
1	WRITER (2:00)	PATENT (4:45)

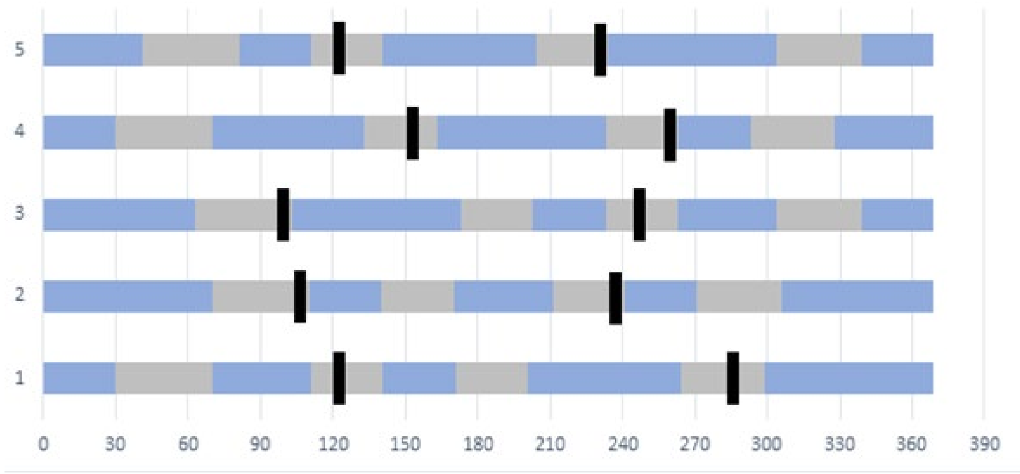
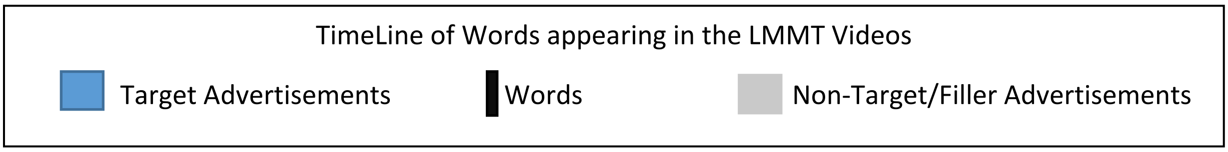


Figure 3.3: Timeline of the video blocks with the timing of word placement in them



The cognitive load was further increased from the low media multitasking condition by introducing another media screen from which to process information. In addition to watching the same television advertisements stimuli on the laptop screen as in other task conditions, the participants in the high media multitasking condition were asked to watch a video on a television screen that was placed adjacent to the laptop screen. The participants were also asked to look out for six-letter words on both the screens and write them on a sheet of paper. Participants were shown three six-letter words during the advertisements stimuli on the laptop screen and four six-letter words on the stimuli on the television screen. The stimuli on the television screen was a 4K Video of the New York Skyline without its audio (Amazing places on our planet, 2015). The total length of the video was 7 minutes and 25 seconds. This video was only played in the HMMT condition. The details of the words and their timings for the laptop screen are presented in Table 3.5. Figure 3.4 and Figure 3.5 present the timing of words exposure respectively.

Table 3.5: Details of words and their timing on the Ad stimuli videos (Laptop)

Video	Word 1 (Time)	Word 2 (Time)	Word 3 (Time)
5	WRITER (1:15)	PATENT (3:40)	SPHERE (5:30)
4	WRITER (1:00)	PATENT (2:30)	SPHERE (4:05)
3	WRITER (1:30)	PATENT (3:00)	SPHERE (5:30)
2	WRITER (1:50)	PATENT (2:45)	SPHERE (4:00)
1	WRITER (1:00)	PATENT (3:00)	SPHERE (4:32)

Figure 3.4: Timeline of different video blocks and the placement of words in each

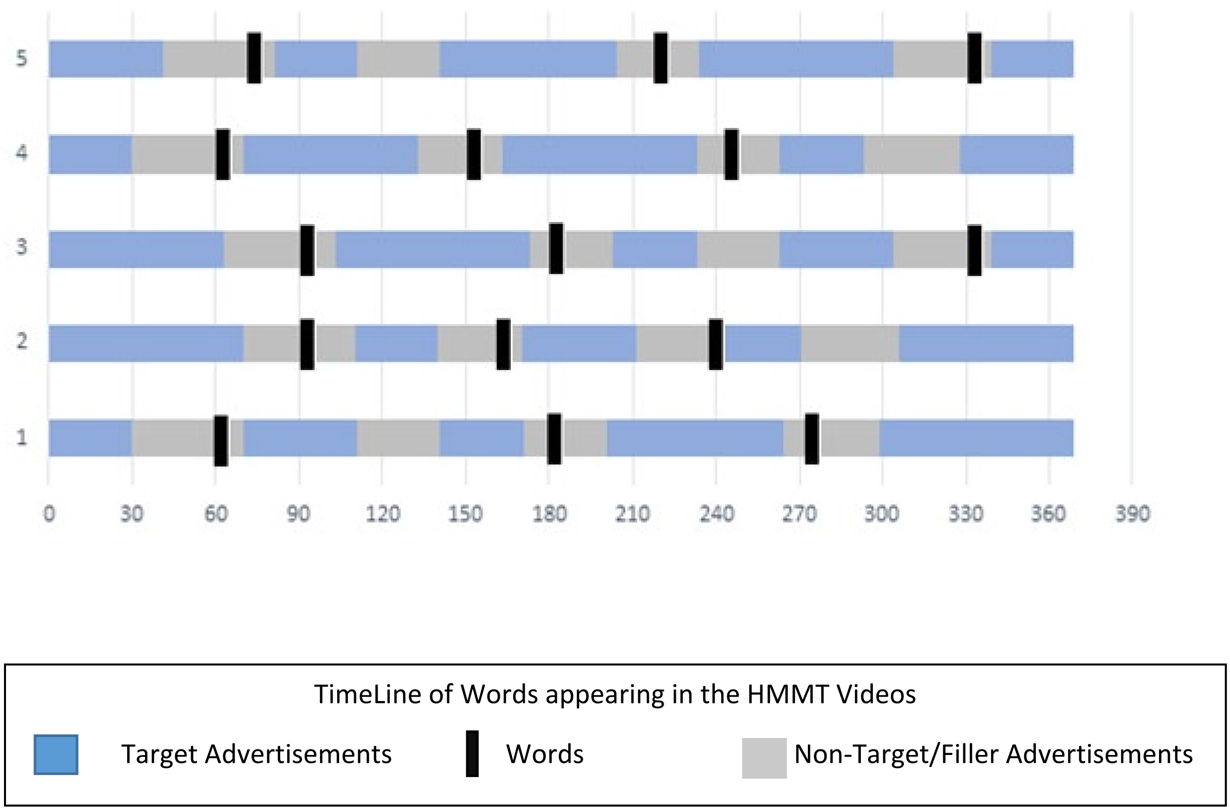


Figure 3.5: Timeline of TV screen video and the timing of words

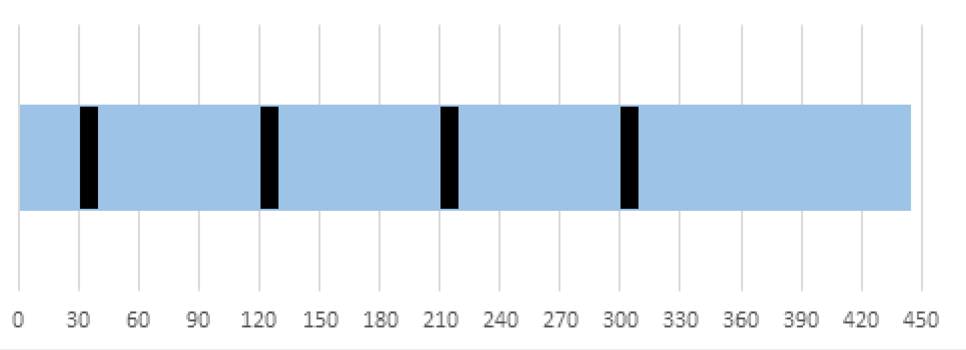


Table 3.6: Details of words appearing on the TV screen

Word 1 (0:32)	Word 2 (2:02)	Word 3 (3:32)	Word 4 (5:02)
RUNNER	ENGINE	FABRIC	HAMMER

3.3.2 Procedure

The experiment consisted of 5 stages, (1) Introduction, (2) Quiz, (3) Instructions, (4) Multitasking, and (5) Questionnaire. The experiment was conducted in a computer laboratory for easy access to a laptop computer and a television screen. The participants were first welcomed to the study and then asked to take a seat in front of the laptop. They were given a consent form for the study, which also included a brief description of a pseudo-study. Participants were provided with a pseudo-study description to eliminate any memory bias. People have an unbiased estimate of memory if they are aware that their memory is being tested (Jacoby, 1991; Shapiro & Krishnan, 2001). Participants were told that they are taking part in a study that is exploring the importance of international travel. The study involved taking part in a small quiz and watching a series of international videos which was followed by a few questions on their past travel destinations and experiences. After signing the consent form, they progressed to the first stage.

Stage 1

In this stage, the participants were given a bowl from which to pick one of three paper chits with the numbers 1, 2 or 3 written inside them. All three chits were made from folded white paper. After picking one chit and reading the number, they were assigned the condition corresponding to each number, that is, participants who picked number 1 were assigned to the HMMT condition, participants who picked number 2 were allocated to the LMMT condition and participants who picked number 3 were assigned the single-tasking condition. After being assigned to one of the three conditions, they were given a sheet of paper and a pen and were asked to log in to the computer system. As all the students were from the University, they were able to log in with their university ID. In the meanwhile, the researcher sent the appropriate *Qualtrics* link corresponding to their conditions of the study to their university email IDs while they logged in to the system. The *Qualtrics* link included the quiz followed by a video (Computer Video) and the questionnaire. After receiving the link, they clicked the link and were directed to the first page of the study. The first page illustrated the importance of travelling in life and an introduction to the second stage of the study, which involved a small quiz on world travel.

Stage 2

This stage included a quiz with 15 questions from around the world. This quiz was part of the deception to distract the focus of participants from the real objective of the study. Each question was a multiple-choice question, with many including pictures for a better visual experience. The participants were asked not to treat it as a test and to choose an answer based on their basic knowledge and experience. Each page included five questions. For each right answer, the participants were given a score of 1 and, with every wrong answer a score of 0. With 15 questions, the maximum achievable score was 15. After completing the quiz, the participants were congratulated on taking the quiz and were asked to continue to the third stage, which included insights into South-Asian culture. The quiz questions are presented in Appendix A.

Stage 3

After taking the quiz, the participants were asked to continue to the next page, which gave them a sneak peek into Asian culture by showcasing a video. This video was comprised of a series of advertisements from South Asian and Middle Eastern countries. Before starting with the video, the participants were provided with a set of instructions pertaining to their condition. The participants in the LMMT and Single-tasking condition were provided with the same instructions. They were asked to look for a six-letter word in red text, which would appear in the middle of the screen during the advertisement. They were asked to write all the words that appeared on a sheet of paper provided to them. The participants in the HMMT condition were given the same instruction with some additional instructions. The additional instructions were to keep an eye on the large television screen, which would also show six-letter red coloured text on the projector screen. They were told the words on the projector screen would be different from the words that would appear on their laptop screen. The participants were asked to try and write all the words that appeared on both of the screens. They were advised to only proceed if they completely understood the instructions; if not, they should call the researcher for assistance. After the instructions, they were asked to proceed to watch the video. Figure

3.6 presents a screenshot of the instructions provided to the participants to identify the six-letter words on the screen.

Figure 3.6: Screenshot of instructions on identifying the six-letter word

Stage 4

In this stage, the participants in all three conditions viewed the stimuli video. The participants in the HMMT condition were exposed to the television screen video in addition to the stimuli video on the laptops. The participants in the HMMT condition were shown seven words in total, four words on the television screen and three words on the laptop screen. In the LMMT condition, the participants were exposed to two words during the stimuli video and participants in the single-tasking condition were exposed to no words during the video.

Stage 5

After watching the video and carrying out the additional task of writing the words on a sheet of paper, the participants completed the questionnaire on the laptop. The questionnaire had questions displayed in the following order: vacation satisfaction, brand memory, brand attitude, manipulation check, and demographic variables.

3.3.3 Participants and Characteristics

One hundred and five students from the University of Plymouth participated in the study. All the participants were aged 18 years and over. The students represented a homogenous group of individuals with similar cognitive abilities, which enabled the effects on brand memory and brand attitude by manipulation of stimuli to be demonstrated. All the students pay high fees for their education which is an indicator of their similar financial situation. They are expected to obtain well-paid jobs after finishing their degrees which makes them a substantial future target market for various products that will be marketed on different media (Mitchell, 2012). As media multitasking behaviour is more prevalent in younger individuals now (Ofcom, 2015), it is expected these younger individuals will have greater financial resources and decision-making powers in the near future. Thus, it is important to understand the effects of media multitasking on a student sample.

3.3.4. Measures and Scales

Independent Variables

Task Condition (Single-tasking vs Low media multitasking vs high media multitasking): Participants were randomly allocated to one of the three conditions. In the Single-tasking condition, participants only watched the stimuli video on the laptop. In the LMMT condition, participants undertook a pen and paper task in addition to watching the stimuli video on the laptop. In the HMMT condition, participants undertook the pen and paper task in addition to watching stimuli on the laptop and processing information from another screen.

Dependent Variables

Brand Memory: The memory of the target advertisements that were shown in the video blocks was calculated in the same way as in the pre-test. For each correct answer, the participants scored a 1, while for an incorrect answer, they scored a 0. This method of calculating brand memory is prevalent in previous advertising research (Voorveld et al., 2011; Segijn et al., 2016, 2017a; 2017b; Jeong and Hwang, 2016).

Brand Attitude: Participants reported their brand attitude for the target brand using the same 7-point semantic differential scale used in the pre-test, with the endpoints of the scale being (i) Bad/Good, (ii) Unappealing/Appealing and (iii) Unattractive/Attractive. These items are taken from Segijn et al.'s (2016) and Voorveld et al.'s (2011) study.

Manipulation Check:

Attention: The attention of the Participants towards the laptop screen was calculated using a single item 7 point Likert scale, where they self-reported their attention from 1 to 7, where 1= paid no attention and 7= high level of attention was paid. In the HMMT condition, the attention towards the second screen (television) was also measured using the same scale.

Difficulty: The Participants' self-reported difficulty in performing the tasks was calculated as well, using the single-item scale. Participants were asked, 'how difficult was the task' from no difficulty to a high level of difficulty, where 1= no difficulty and 7= a high level of difficulty. This scale has been used by Chung and Monroe (2000) and was adapted from Samuelson (1991).

3.4 Results and Analysis

3.4.1 Assumptions

The data analysis of this study compared the mean scores of brand memory and brand attitude of different task conditions using the t-test and Analysis of Variance (ANOVA) (Pallant, 2013). There are some general assumptions that apply to both the t-test and ANOVA. Below are the assumptions that need to be considered before conducting the aforementioned tests.

1. Level of Measurement: The dependent variables are measured at the ratio or interval level; on a continuous scale. Both brand memory and brand attitude were calculated on a continuous scale. Brand memory was calculated on a scale from 0 to 15, while brand attitude was calculated using the 7 point-Likert scale.

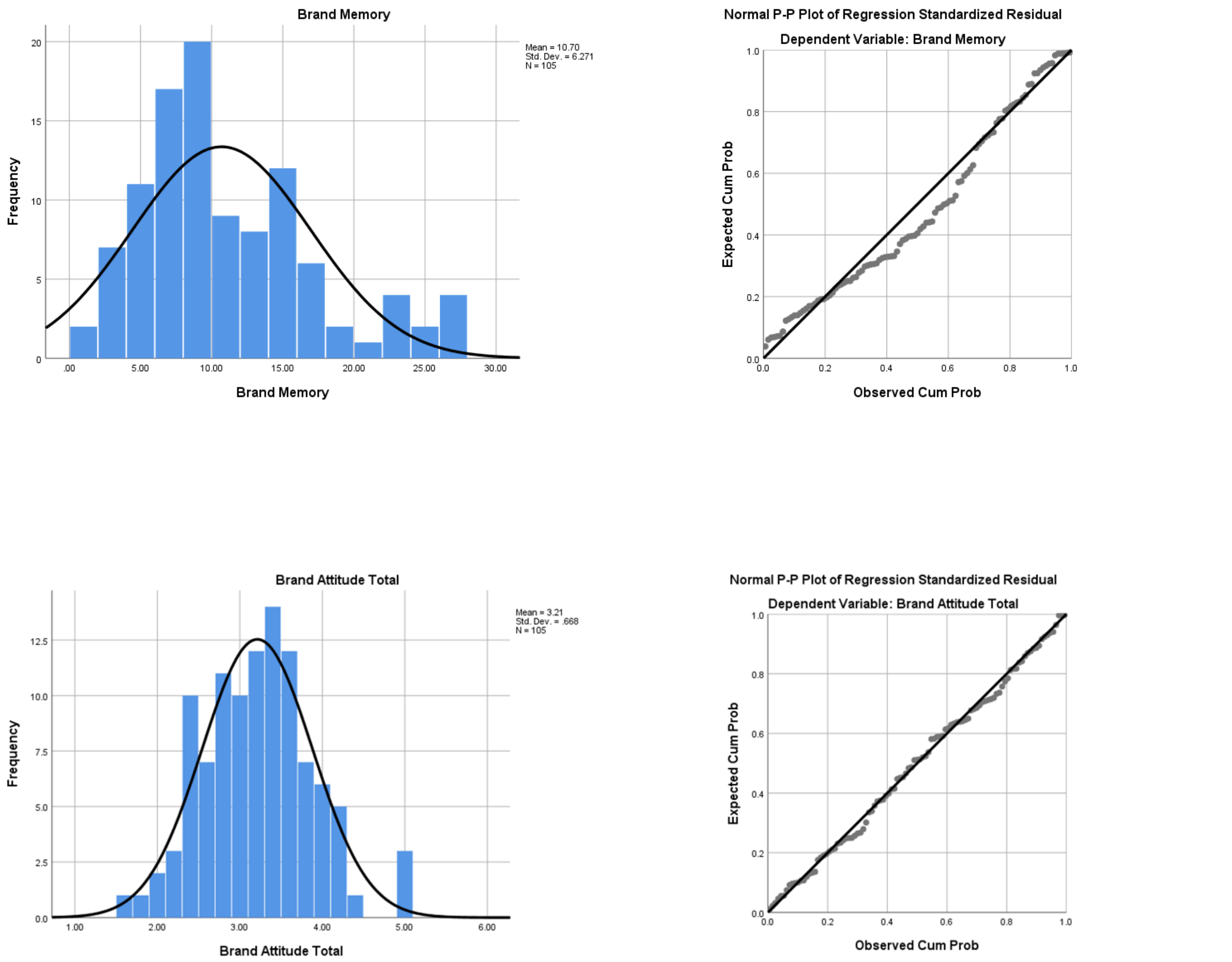
2. Random Sampling: The scores were obtained from random sampling. Participants were allocated to each task condition by picking a piece of paper chit.

3. Independence Observation: The participants' responses were recorded individually with no interference or influence from another person. Each participant responded one at a time in the research laboratory.

4. Normal Distribution: The normality of the dependent variables was checked by histogram and the normality probability plots. In Figure 3.7, the left side presents the histogram and the right side presents the normality probability plot of brand attitude. Brand attitude variable presents a bell curve on the histogram and follows the diagonal line on the normality probability curve, but brand memory does not present a bell curve or follows the diagonal line on the normality probability curve. Thus, it can be confirmed

that only brand attitude is normally distributed, and brand memory violates the normal distribution assumption.

Figure 3.7: Normality of Dependent Variables on Histogram and PP Plots



Homogeneity of Variance: One of the important assumptions of the ANOVA and t-tests is that samples are obtained from a population of equal variances (Pallant, 2013). This means that the sample in each of the task conditions is similar in its variance. Levene's test for equality of variance showed that the groups were not significantly different from each other in variance for brand attitude (p =.235) and brand memory (p =.115) scores. It can be confirmed that the task conditions were similar in their variance.

3.4.2 Manipulation Check

A one way ANOVA test was conducted to check the participant's self-reported attention during the study. There was a significant difference in the attention reported by participants in the three conditions [F (2, 102) = 6.905, p<.01]. The participants in the single-tasking condition $\bar{X}$= 5.17, SD= 1.29) reported the highest self-reported attention. Participants in the LMMT condition ($\bar{X}$= 4.28, SD =1.52) reported low self-reported attention and participants in the HMMT condition reported the lowest attention towards the stimuli screen ($\bar{X}$= 3.87, SD =1.68). The reason for the HMMT participants reporting the lowest attention towards the laptop screen was because they were also paying attention to the television screen ($\bar{X}$= 5.36, SD =1.17). Similarly, there was a statistically significant difference in the difficulty in performing the tasks between participants in the three conditions [F (2, 102) =14.90, p <.001]. As expected, the participants in the HMMT condition reported the highest difficulty ($\bar{X}$= 5.45, SD =1.44), the LMMT participants reported slightly less difficulty ($\bar{X}$= 4.34, SD =1.62) and participants in the single-tasking condition reported the lowest difficulty ($\bar{X}$= 3.42, SD =1.59). These results confirm that media multitasking was manipulated as intended, where single-tasking was not difficult and participants were able to pay a high level of attention towards the ads on the laptop, whereas HMMT participants found the task difficult and thus not able to pay high level of attention towards the ads on the laptop.

3.4.3 Descriptive

In this section, the descriptive statistics of all the variables used in this study are presented. The dependent variables were brand memory and brand attitude. The control variables and the demographic variables were age, gender and educational qualifications. Table 3.7 presents the descriptive statistics of this study

Table 3.7: Descriptive Statistics of Study 1

Variable	**Single-Tasking (N = 35)**	**LMMT (N = 35)**	**HMMT (N = 35)**	**Overall (N = 105)**
Age	22.28 (3.78)	23.14 (5.72)	23.68 (3.65)	23.03 (4.48)
Gender	Male = 17 Female = 18	Male = 12 Female = 23	Male = 12 Female = 23	Male = 41 Female =64
Education	High School = 3 College = 8 Bachelors = 18 Masters = 6	High School = 2 College = 8 Bachelors = 12 Masters = 11 PhD = 2	High School = 1 College = 3 Bachelors = 20 Masters = 10 PhD = 1	High School = 6 College = 19 Bachelors = 50 Masters = 27 PhD = 3
Attention	5.17 (1.29)	4.28 (1.52)	3.85 (1.68)	4.43 (1.59)
Difficulty	3.42 (1.59)	4.34 (1.62)	5.45 (1.44)	4.40 (1.75)
Brand Memory	14.0 (6.78)	10.62 (5.47)	7.45 (4.71)	10.69 (6.27)
Brand Attitude	3.38 (.63)	3.15 (.58)	3.09 (.76)	3.21 (.66)

A randomisation check was undertaken to ascertain whether there was a difference in age, gender and education among the three task conditions using ANOVA for age and Chi-square for gender and education. Age fulfilled all the assumptions required to conduct ANOVA, Levene's test of homogeneity of variance had a significance value greater than

.05 (p =.539) which indicates equal variance in the age for each of the three conditions. The ANOVA results also showed that there was no difference between the age of participants among the different task conditions (p =.424). Thus, the age of the sample among all three conditions was not different. Similarly the randomisation of gender and education revealed that there was no statistically significant effect of gender (p >.368) or educational qualifications (p >.237). In summary, age, gender and education were equally divided among the three task conditions.

3.4.4 Comparing the effect of Single-tasking with Media Multitasking on Brand Memory and Brand Attitude

The means and standard deviation of brand memory and brand attitude for single tasking and media multitasking conditions are presented in Table 3.8. Dummy coding was used to compare single tasking and media multitasking conditions. Dummy was created for single-tasking, where single tasking was coded 1 and HMMT and LMMT were coded 0. An independent t-test was conducted to compare the effects of single tasking and media multitasking on brand memory. The results showed that there was a difference in brand memory for single-taskers ($\bar{X}$= 14.00, SD =6.78) and media multitaskers [($\bar{X}$= 9.04, SD =5.31), t (103) = 4.09, p <.001]. The magnitude of the difference between in the mean scores of brand memory was high (eta square = .14) (Cohen, 1988). It can be confirmed that media multitasking negatively affected the memory of advertisements. Thus, Hypothesis H1 is supported.

Similarly an independent t-test was conducted to compare the effects of single tasking and media multitasking on brand attitude. The results of the t-test show that there was not a difference in the brand attitude scores of participants in the single-tasking ($\bar{X}$= 3.38, SD

=.63) and media multitasking conditions [($\bar{X}$= 3.12, SD =.67), t (103) = 1.88, p = .06]. From the above t-tests it was confirmed that there was a difference in brand memory of single-taskers and media multitaskers but there was no difference in their attitude towards the brand attitude. In the next section, the three task conditions are compared for a more detailed review of their effect on brand memory and brand attitude. There was not enough evidence to conclude that media multitasking was positively affecting brand attitude, therefore, hypothesis H2 was rejected.

3.4.5 Comparing the effect of cognitive load of media multitasking on brand memory and brand attitude.

The participants in the three task conditions experienced different cognitive loads and in this section their effect on brand memory and brand attitude was examined. HMMT participants experienced the highest cognitive load, LMMT participants experienced low cognitive load and single-tasking participants had the least cognitive load during their tasks. A one-way comparison between groups ANOVA was conducted to ascertain the effect of different conditions on brand memory. There was a statistically significant difference between the three conditions in their brand memory scores [F (2,102) =11.44, p <.001]. Table 3.8 presents the brand memory scores of the three conditions. The difference in the mean scores between the groups was large as well as the size of their effect (eta square = .18). Post-hoc comparisons compare each condition with the other two conditions, and it was found that single-taskers were significantly different from LMMT (p <.05), as well as with the HMMT in their brand memory (p <.001). However, there was not a significant difference between LMMT and HMMT conditions' brand memory scores (p =.058). The results from the one way ANOVA confirmed that brand memory significantly reduces when the cognitive load increases from single task to multitask but there is no significant difference in the brand memory when cognitive load increases within multitasking. Therefore, hypothesis H3 was not supported.

In another one-way comparison between groups ANOVA was conducted to ascertain the effects of cognitive loads in different task conditions on the brand attitude. The results showed that there was no statistical difference between the brand attitude scores of different task conditions [$F(2,102) = 1.81$, $p = .167$]. The post hoc comparison between the different task conditions revealed that there was no difference among any of the conditions in their brand attitude scores. Single tasking did not significantly differ from LMMT ($p = .324$) nor with HMMT ($p = .174$) in brand attitude scores. Increase in cognitive load in media multitasking also showed no difference in the brand attitude scores, as there was no difference between the LMMT and HMMT conditions' brand attitude scores ($p = .931$.). The results from the ANOVA confirm that increase in cognitive load between different task conditions does not change the brand attitude. It can be concluded that cognitive load is not positively affecting brand attitude, thus, hypothesis H4 is rejected.

There was not a significant difference in brand memory and brand attitude among different cognitive loads but the mean scores of brand memory and brand attitude were lower for higher cognitive load conditions. The manipulation of cognitive load in task conditions was successful, which indicates that higher cognitive load is related to lower brand memory but not to brand attitude. A simple correlation test revealed that irrespective of different task conditions, difficulty in performing a task was negatively related to brand memory. The test also revealed that attention was positively correlated with brand memory. Segijn et al. (2017) in their study showed that attention mediates the effect of media multitasking on brand memory and brand attitude. On the other hand difficulty has not been thoroughly considered by researchers in unravelling the effect of media multitasking on information processing and eventually its effect on advertising.

3.5 Summary

This study was conducted in order to examine the findings of previous media multitasking studies on advertising outcomes. This study used the effectiveness of unfamiliar foreign television advertisements in different task conditions on a British student sample. The sample was randomly allocated to one of three different task conditions, single-tasking, low media multitasking and high media multitasking. Participants were asked to watch a series of television advertisements while either doing the single task of watching the advertisements (single tasking) or undertaking a pen and paper task in addition to watching the advertisements (low media multitasking) or undertaking a pen and paper task and watching another screen in addition to watching the advertisements (high media multitasking). In this study single taskers were compared with media multitaskers in their score of brand memory and brand attitude using t-tests to examine previous research findings. The results of the study partially support previous findings as this study found a significant difference in the brand memory of single taskers and media multitaskers. These results support the hypothesis H1 of this research. However, there was no significant difference in brand attitude scores of single taskers and media multitaskers, which lead to a rejection of hypothesis H2. This study also compared the effect of cognitive loads of different task conditions on brand memory and brand attitude using one way ANOVA. Interestingly, there were no significant differences to conclude that high media multitasking is any different from low media multitasking in brand memory and brand attitude scores. Thus, hypothesis H3 and hypothesis H4 were rejected.

The results of this study support the findings of past literature, that media multitasking is detrimental to advertising memory (Voorveld et al., 2011; Duff and Sar, 2015, Jeong and Hwang, 2016). However, contrary to the prior findings by Yoon et al. (2011), Segijn et al (2016) and Segijn et al. (2017), there was not enough evidence found in this study to support the proposition that media multitasking is beneficial to brand attitude. Another important finding from this research revealed that there was no difference in the brand memory or brand attitude of people, whether they were engaged in low level of media multitasking or high levels of media multitasking. The difference in the cognitive load of low media multitasking and high media multitasking does not result a significant difference in their brand memory or brand attitude. However, a trend was observed in this study that as the self-reported difficulty was high the effect on brand memory was low. In the next chapter the role of difficulty is further explored by understanding its role in cognitive processing.

CHAPTER FOUR STUDY 2: THE ROLE OF PHYSICAL AND COGNITIVE DIFFICULTY IN EXPLAINING THE PROCESSING OF ADVERTISING MESSAGES WHILE MEDIA MULTITASKING

4.1 Overview

In the previous chapter, single-tasking was compared with low media multitasking and high media multitasking, and it was found that as the level of media multitasking increases, the memory of advertisements decreases but not significantly. The results were confirmatory to the previous studies highlighting that poor memory in media multitasking is due to a fall in attention (Segijn et al., 2017; Shapiro and Krishnan, 2001). The results also identified self-reported perception of difficulty to affect advertisement memory negatively. Past literature has also identified task difficulty as one of the reasons for poor information processing during multiple tasks (Sanbmatsu et al., 2013; Shin et al., 2019).

The role of task difficulty is crucial in predicting the performance of multiple tasks to understand human psychology, but it has been overlooked in marketing studies. Media multitasking is difficult as it involves physical effort to operate two or more media as well as cognitive effort to process information from those media. The perception of difficulty experienced during media multitasking can be categorised into two types of difficulty, (i) physical difficulty and, (ii) cognitive difficulty (Rosenbaum et al., 2001; Kool et al., 2010). There has been little research in comparing different types of task difficulty on information processing (Potts et al., 2017), but a difference in their effect on processing advertising messages is expected. It is important to identify the differences in their effect as it will help the advertisers to avoid a particular type of difficulty, which is more detrimental than the other.

Using Wicken's Multiple Resource Theory (1984) as the foundation for this study, Study 2 proposes that as the difficulty of doing multiple tasks increases, the processing of the advertising message will depend on the relationship between the mental and physical resources required for media multitasking. According to Wicken, the increase in the difficulty of tasks requires additional resources mental and physical resources to maintain the same level of information processing. The resources required to process information is finite and it is expected that that resources of one task will be compromised to meet the requirement of another task (Kahneman, (1973). However, it is proposed that physically difficult media multitasking will not deteriorate information processing as it will draw additional muscular resources to match the physically demanding task and not compromise the processing power of the advertising message. The pool of resources for muscle movement (physical) and learning (information processing) are mutually exclusive and do not compete with each other (Mayfield Clinic, 2020). Whereas, a cognitively difficult task requires additional mental resources which use the same resources required for the processing of the advertising message while media multitasking. Thus, it is proposed that physically difficult media multitasking (PDMT) has a positive effect on advertising outcomes and cognitive difficulty media multitasking (CDMT) has a negative effect on advertising outcomes.

Two studies were conducted in Delhi, India, to test the proposed research hypothesis. The first study (2A) compared the self-reported difficulty between single-tasking conditions and media multitasking conditions. The objective of the study was to test the effect of perceived task difficulty on advertisement memory. The second study (2B) builds on the results of study 2A and explores the effect of different types of difficulties on advertisement memory. In the second study (2B), the type of difficulty (physical vs cognitive) was manipulated to compare their effect on the advertisement memory while media multitasking.

The present study has one analytical goal, that is, to understand and describe the role of difficulty in the processing of the advertising message while media multitasking. The difficulty is measured by self-report measures and validated by a change in physiological differences such as heart rate and blood pressure. Heart rate and blood pressure indicate the workload of coping with difficulty. It is known that the increase in task difficulty, either physical or cognitive, forces the heart to pump more blood and supply resources to the body to handle the difficult task (Veltman and Gaillard, 1998; Richter et al., 2008). Thus, the difficulty of tasks in both the studies was also measured by the heart rate and blood pressure of participants. Table 4.1 presents the research hypothesis of this study.

Table 4.1: Summary of hypothesis and list of variables for study 2A and study 2B

Study No.		Independent Variable	Mediator Variable	Dependent Variable	Hypothesis	Model
2A	H5	Media Multitasking		Difficulty	Media multitasking is perceived to be *more difficult* than watching a single screen.	t-Test
2A	H6	Media Multitasking		Brand Memory	Media Multitasking will be negatively related to advertising memory.	Regression
2A	H7	Media Multitasking	Difficulty	Brand Memory	Difficulty mediates the effect of media multitasking on advertising memory.	Mediation Model
2B	H8a	Physical Difficulty		TV Brand Memory	Physically difficult media multitasking will have a positive effect on TV advertising memory.	Simple Regression
2B	H8b	Physical Difficulty		Mobile Brand Memory	The physical difficulty will have a positive effect on the *Mobile Advertising memory*	Simple Regression

2B	H9a	Cognitive Difficulty	TV Brand Memory	The cognitive difficulty will have a negative effect on the *memory of the brands shown on TV*.	Simple Regression
2B	H9b	Cognitive Difficulty	Mobile Brand Memory	The cognitive difficulty will have a negative effect on the *memory of the sponsored brand shown on mobile*.	Simple Regression

4.2 Stimulus and Research Setting

The objective of this study is to examine the difficulty experienced while media multitasking and its impact on information processing. A lab experiment that simulates the real-life experience of media multitasking to address the research objective was conducted, and an appropriate stimulus had to be selected. Most of the previous media multitasking research and the previous study of this thesis has focussed on explicit advertising such as TV commercials (Bellman et al., 2012; Duff and Sar, 2015; Segijn et al., 2016). This study focussed on embedded advertising (such as billboard advertising, advergaming and product placement) as memory effects of incidental advertising have not gained attention from researchers (Moorman et al., 2012).

Watching Live TV while-communicating through social media is one of the most recorded multitasking combinations that involve TV and mobile (Ofcom, 2015). The 2018 FIFA World Cup Final in Russia was the most-watched TV broadcast all over the world; almost half of the world's population watched the tournament on TV and digital platforms (FIFA, 2018). The Football World Cup was an important platform for advertisers to communicate with a broad global audience. Many prominent brands such as Coca-Cola, Adidas and McDonald's partnered with the event and were seen on perimeter billboards as sponsors during the game. There were some other brands like Vivo, Alfa-Bank and Wanda, which are not as popular who also partnered with the event and were seen on perimeter boards as sponsors to expand their reach. Thus, billboard advertising in a football match was chosen as a stimulus for this study.

Sports sponsorship is a vast and growing market with global spending of more than US$ 65 billion, as reported in 2018. Europe is second only to North America in terms of sponsorship spending, accounting for approximately 27% of the global sponsorship

(Guttmann, 2019). In comparison to other sports, football is the most popular sport in Europe with the highest TV viewership, highest prize money, expensive TV broadcast rights and multi-million sponsorship and endorsement deals (Totalsportek, 2020). There have been studies that have focussed on the sponsorship effectiveness of familiar brands (Angell et al., 2016; Zdrakovic et al., 2015 Angell et al., 2020). Unfamiliar brands also need to be tested to understand the effectiveness of sponsorship outcomes better as they minimise prior attitudes and associations (Rodgers, 2003). The sponsorship effectiveness of the most popular sport in Europe without any bias for brand attitudes and associations in a non-European research setting had to be tested. The researcher is from Delhi and had the convenience of conducting the experiment in India, a non-European country where the sponsors of European football are relatively unfamiliar. Thus, Delhi, the capital of India, was chosen as the research setting for this study.

India is a growing market for Football, with more than 50% of those aged 24 or less reporting themselves to be highly interested in the sport. Processing the brand names written in English Roman characters is easier for people who have English as their official or second language (Ahn & La Ferla, 2008; Gerritsen, et al., 2010). India has English as one of the official languages, and almost 83 million people speak it as their second language (Rukmini, 2019). It was easier for people of India to process European brand names as compared to other countries as it has a high English literacy rate than many other countries outside Europe (Education First, 2019).

4.2.1 Stimulus Development

The objective of this study is to decipher the effect of difficulty on sponsorship effectiveness while media multitasking by controlling the affective states familiarity of brands. To minimise the familiarity and involvement of fans, the UEFA Europa League was selected as a source of the stimuli since it has lower viewership than other international leagues and tournaments in India (McNicholas, 2013). A Europa League knockout stage match from the 2017-18 season was selected as the stimulus. The knockout match with the highest number of goals scored during the match was selected as the stimuli, as people prefer to watch sporting events with high-scoring (Paul and Weinbach, 2007). The second round quarter-final match between RB Leipzig and Marseille was the highest-scoring match of the season as it had seven goals between the two teams. It was expected that there would be lower fan involvement in this match as both the teams do not have any substantial fan base in India (Brand Finance, 2018)

The highlights of the football quarter-final match were selected as the stimuli as they included all the actions of seven goals. The duration of the highlights was of five minutes and fifteen seconds, which included five brands on the perimeter boards and two brands on the shirts of the two teams. The stimuli video included the sponsored brands as it was seen in the real-time broadcast and was appropriate for the pre-test to check for familiarity and saliency.

All of the brands in the stimuli video were visible for at least 15 seconds in the video, with the maximum visibility of a brand being no more than 33 seconds. Out of the five brands listed in Table 4.2, three brands were selected as the target brands as they were visible for the same amount of time to control the exposure time of each brand. The shirt sponsors of both the teams were also treated as the stimuli brands. The video was edited to blur out the non-target brands to control the visibility of the brands of the target brands. The restricted viewing of non-target ads by blurring does not influence the processing of information or the performance of cognitive tasks (Bednarik and Tukiainen, 2004; Loschky et al., 2014). The blurred region of stimulus does not draw attention more than the region of visual clarity unless that task is to focus on the blurred region (Enns and

MacDonald, 2013). In Figure 4.1, the stimuli brands on the perimeter boards (bottom right) and the player's shirts (top two) can be seen in the snapshots from the stimuli video, whereas the blurred perimeter boards (bottom left) of non-target brands can also be seen in the snapshot.

Table 4.2: Visibility duration of the stimuli brands

Brands	Product	Duration of Visibility
Panchade	Beer	27 seconds
Hankook	Tyres	33 seconds
Enterprise	Car Rental	15 seconds
UniCredit	Banking	28 seconds
FedEx	Logistics	28 seconds

Figure 4.1: Snapshots of visible brands and sponsors

A pre-test was conducted with two objectives; (1) to test low brand familiarity of the sponsored brands of a football match (Segijn et al. 2017); (2) to test brand saliency of sponsors in football matches being watched on a single screen (Jin et al., 2008)

4.2.2 Pre-test: Participants and their characteristics

Jamia Millia Islamia (JMI), a public research university in Delhi, was selected as the research setting of this pre-test due to the convenience of familiarity of the university with the researcher. JMI is the alma-meter of the researcher, which helped in easy access to permissions and the use of research laboratories for data collection. Posters for an invitation to participate in the study were put up in cafes and libraries of the JMI campus. Among the people who expressed interest in participation, twenty-two males and females 18 years old and over who was able to watch TV were selected as the final sample for the pre-test.

4.2.3 Method and Design

The pre-test was conducted in a laboratory to replicate a natural TV viewing experience of a living room. An armchair was set up in front of a TV to sit and watch the stimuli comfortably. Before the start of the experiment, the participants were greeted and were given an informed consent form to complete. After they completed the consent form, they were given the instructions for the pre-test. They were asked to watch the entire 5 minutes and 15-seconds stimulus video with complete attention. After watching the video, the participants completed a questionnaire with questions displayed in the following order:

filter questions, football involvement, fan involvement, attention, brand memory and control variables.

4.2.4 Pre-test measures

Filter question: The purpose of the first question of the questionnaire was to eliminate previous exposure to the stimuli. The participants were asked, 'Have you ever seen this video clip before today or the live telecast of this match?'. The participants responded either Yes or No.

Football Involvement: The football involvement of the participants was measured with a four-item using a seven-point Likert scale from strongly disagree to strongly agree. The scale was originally a consumer involvement scale given by Laurent and Kapferer (1985), which was adapted for soccer by Lardinoit and Derbaix (2001). The scale used the following items; 'It gives me pleasure to watch football', 'Watching football is like buying a gift for myself', 'I attach great importance in watching football', and 'One can say watching Football interests me a lot'. It has been widely used in the advertising literature to measure fan involvement (Angell et al. 2016)

Fan Involvement: Participants were asked about their involvement with the football clubs in the stimuli video. The fan involvement for each of the teams was measured using a single item on a seven-item Likert scale, from strongly disagree to strongly agree, adapted from the scale given by Wann and Branscombe (1993). The participants reported their involvement with each team using the item, 'How strongly do you see yourself as a fan of RB Leipzig/Olympique de Marseille?'

Attention: Attention was measured with a single-item Likert scale by asking participants how much attention they paid to the stimuli video on TV on a scale from 1 to 7, where 1 was no attention and 7 was high level of attention. The single item scale for attention has been widely used in the advertising literature (Segijn et al., 2017; Jeong and Hwang, 2012).

Brand Memory: Brand memory was measured by recognition of target brand names from their logos. Recognition is a more sensitive measure of recollection and is essential for advertisers in creating stronger associations with the brand (Duff and Sar, 2015). Participants were provided with a pool of fifteen brand logos which included the five stimuli brands and two non-sponsored competitors of each of the stimuli brand (2x5) within the same product category to minimise intelligent guesses (Wakefield et al. 2007; Lardinoit and Debaix, 2001). This method of calculating brand memory is adapted from Angell et al. (2016).

Control Variables: Participants reported their familiarity with Europe in general by asking them to report whether they travelled to Europe or the UK in the past three years. They were also asked to report their proficiency in the English language. They were asked to report about how proficient, according to them, they think they are in English on a scale from 1 to 7, where 1 was not at all and 7 was highly proficient. Finally, they reported their age, gender and education qualification.

4.2.5 Pre-test Results

The pre-test was successful in identifying low brand familiarity and brand saliency of the stimuli brands. The results are based on the responses of the twenty-two participants who watched the stimuli video and completed the questionnaire. None of the participants had ever seen the stimuli video before the experiment and had never visited the UK or Europe in the last three years. All the participants reported a higher level of attention towards the TV [$\bar{X}$ = 5.23(1.15)]. As expected, the brands were unfamiliar but still noticeable by the participants. Table 4.3 illustrates the familiarity of each of the brands in the sample. None of the brands reported more than 37% of familiarity, RedBull was the most familiar brand with almost 37% of people reporting to be familiar with the brand, whereas, Panachade was the least known brand with less than 5% (only one person) reporting to be familiar with the brand. Collectively the familiarity of all the sponsored brands was less than 25% and was deemed fit for the study.

Table 4.3: Brand Familiarity and Recognition of Pre-Test Brand

Stimuli Brand	Familiarity	Unfamiliarity	Brand Recognition
Orange	4 (18.18%)	18 (81.81%)	11 (50%)
RedBull	8 (36.36%)	14 (63.63%)	13 (59.09%)
FedEx	7 (31.81%)	15 (68.18%)	12 (54.54%)
UniCredit	5 (22.72%)	17 (77.27%)	12 (54.45%)
Panachade	1 (4.54%)	21 (95.45%)	13 (59.09%)

Table 4.3 presents the brand recognition of each brand in the sample. Every brand has at least 50% of the recognition when the participants have paid complete attention. Among the five, Panachade has the highest brand recognition, with almost 60% of respondents correctly identifying its logo, whereas Orange Telecom has the lowest recognition, with precisely 50% of respondents identifying it.

The total brand memory [$\bar{X}$=2.77(.75)] of each respondent was calculated by the sum score of the correct identification of each target brand. A score of 1 was given for correct identification of a target brand and zero for any wrong identification. A maximum score of 5 can be achieved by correctly identifying all five target brands. Every respondent was able to recognise at least two brands from the stimuli video. The total brand memory of the sample was higher than 50%, which satisfied the pre-test's saliency objective (Segijn et al., 2017).

A bivariate correlation was conducted to explore the effects of an individual's attention towards the TV, English proficiency, Age, Football Involvement (Marseille and RB Leipzig), and Fan Involvement on the total brand memory. There was a positive correlation between attention towards the TV and brand memory (p= .017), other than that; English proficiency (p= .06), age(p= .212), fan involvement [Marseillle (p= .170); RB Leipzig (p= .156)], and football involvement (p= .623) did not have any significant relationship with the brand memory. An independent t-test was conducted and it was found there is no difference in brand memory between gender (p= .247) and a one-way ANOVA was conducted to confirm that brand memory was not different among education (p= .432) levels.

4.2.6 Pre-test Summary

The pre-test satisfactorily confirms that the stimulus is appropriate for facilitating the second study (Experiment 2A and 2B). The sponsored brands are unfamiliar and are easily noticeable to the research sample. The brand memory of the sponsors is positively related to the attention towards the TV, which supports previous research (Duff and Sar, 2015; Segijn et al., 2017). The brand memory was not affected by football involvement, fan involvement, English proficiency, education, gender or age of the participants. These results allow the research hypothesis of this study to be tested with this stimulus in the following study 2A.

4.3 Empirical Evidence: Study 2A

This experiment will shed some light on the people's perception of difficulty while they are watching a football match and simultaneously using their phones and how it impacts their memory of sponsored brands of the football match. A single factor design was used with two conditions, single-tasking and media multitasking. This study will explain the effects of media multitasking and difficulty on people's cognition as well as their physiology (heart rate and blood pressure). The heart rate and blood pressure will be measured at pre-defined times to measure the impact of media multitasking on the physiology of the human body.

4.3.1 Stimuli

Experiment 2A was carried out in a laboratory in the same way as in the pre-test to replicate a living room. A total of 136 people from Delhi, India, were randomly assigned either to the single-tasking condition or to a media multitasking condition. In the single-task condition, participants were asked to watch the stimuli on the TV without conducting any additional tasks. The participants in the media multitasking condition were required to use a smartphone (iPhone SE) provided by the researcher while simultaneously watching TV. The participants were provided with a smartphone to read and reply to the text messages to simulate natural media multitasking. The text messages were pretested for their unrelatedness to the video and were sent at pre-defined times. The details of the text messages are provided in the latter part of this section. The primary task was to watch the stimuli on TV. The stimuli for the experiment was the same football match highlights which were used in the pre-test. The secondary task was to read and reply to text messages on the smartphone using WhatsApp messenger.

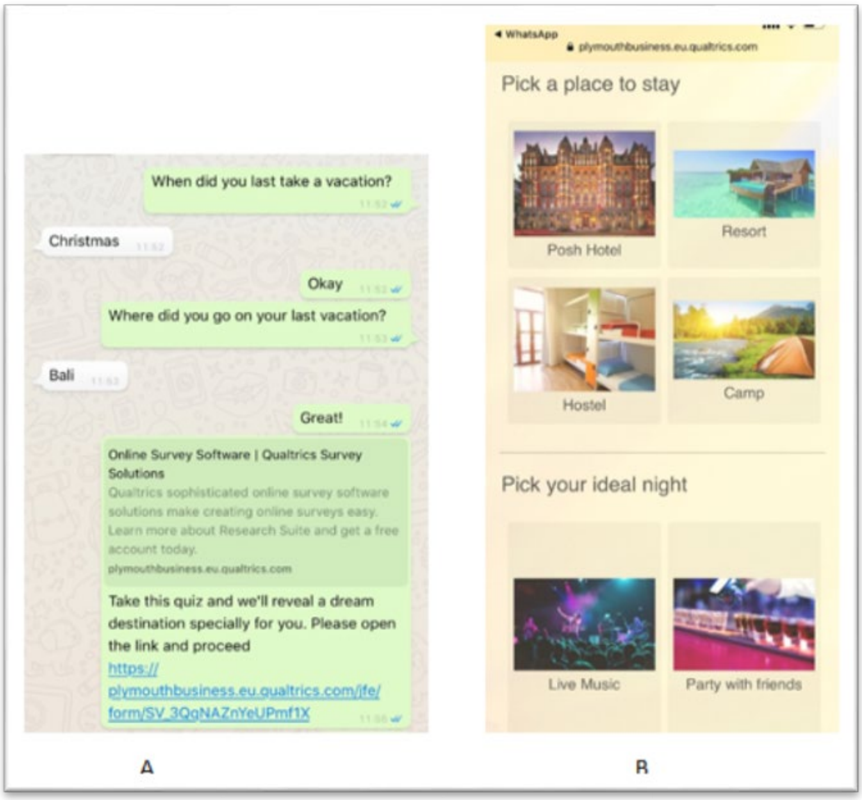
The chat messages were pre-scripted and the same for all media multitasking participants. The chat messages were intentionally unrelated to the video on the TV screen to eliminate potential bias due to task relatedness (Angell et al., 2016; Segijn et al., 2017). The messages were pre-tested using two doctoral supervisors and three PhD students, who are specialists in marketing, to assess their relatedness with the football match stimuli. The participants' were sent five text messages in total; out of those, three were sent at predefined time points to avoid dividing participants attention when the target brands were visible. The other two text messages were sent immediately after getting a reply from the participants on the first two predefined text messages. The first message was in the form of general questions about the participant's last holiday, (1) *when did you last take a holiday?* The next text message sent by the researcher was '*Okay'* in response to the participants' reply to the earlier text. The time for this message is not predetermined but was sent immediately after receiving the response from the participants. The third message was *'Where did you go on your last holiday?'* The fourth text was '*great!*' in reply to the participants holiday destination, the time for this message was also not predetermined and was immediately sent after receiving a reply from the participants. The fifth text message was a link to an online interactive quiz.

Table 4.4: Text messages and their details

Text No.	Text Message Time	Text Message Content
1	0:15	When did you last take a holiday?
2	Immediately after reply	Okay
3	2:00	Where did you go on your last holiday
4	Immediately after reply	Great!
5	3:35	Take this quiz and we will reveal a dream destination especially for you! Please open the link and proceed

The interactive quiz was specifically designed for this study on *Qualtrics*. The quiz was made similar to other multiple online interactive quizzes found on popular social news and entertainment websites such as *BuzzFeed* and *MTV.* The interactive quizzes are a source of momentary entertainment on social media and are extremely popular among people of all age groups (Haynam, 2015; Grandoni, 2014). The purpose of the quiz was to replicate unrelated social media usage by people while watching TV. The quiz included five multiple-choice questions regarding participant's preferences of (a) activity, (b) accommodation, (c) ideal night, (d) drink and (e) food. Participants were required to choose one of four choices and submit their responses. After completing the quiz, a summer holiday destination based on the participant's responses was revealed. Finally, they were revealed *Monaco, French Riviera,* as their summer destination. The same summer destination was revealed for all the participants. The chat messages were designed to imitate real-life interactions on smartphones. Figure 4.2 presents the screenshot of text messages and the interactive quiz.

Figure 4.2: (A) Snapshot of the text messages and (B) Snapshot of interactive quiz



4.3.2 Procedure

The real purpose of the study was not revealed to participants to eliminate memory bias, as prior knowledge of memory test could have impacted the results collected. Process disassociation procedure was used to parse out the effect of conscious memory retrieval by not revealing the real purpose of the study (Jacoby, 1991; Shapiro & Krishnan, 2001).

The participants were informed of a pseudo-objective of the study, which was to understand the physiological reactivity of watching football. The real purpose of the study was revealed to all the participants after the experiment. Participants having hypertension illness, pregnancy or anxiety disorders were excluded from the sample, as their blood pressure and heart rate variability could be different from other participants (Singh, et al., 1998; Solanki, et al., 2020). The participants with none of those mentioned above conditions were included in the study. Participants were also asked to refrain from smoking, eating or drinking 1 hour prior to the experiment (Wetherell, et al., 2006). The experiment consisted of four stages, (1) Introduction, (2) Task, (3) Questionnaire and (4) Debriefing. The participants were first welcomed for their interest in the study and then given a brief description of the pseudo-study. The participants were asked to switch off their mobile phones and put them away until the end of the experiment. The process of the experiment is explained in the following stages.

4.3.2.1 Introduction

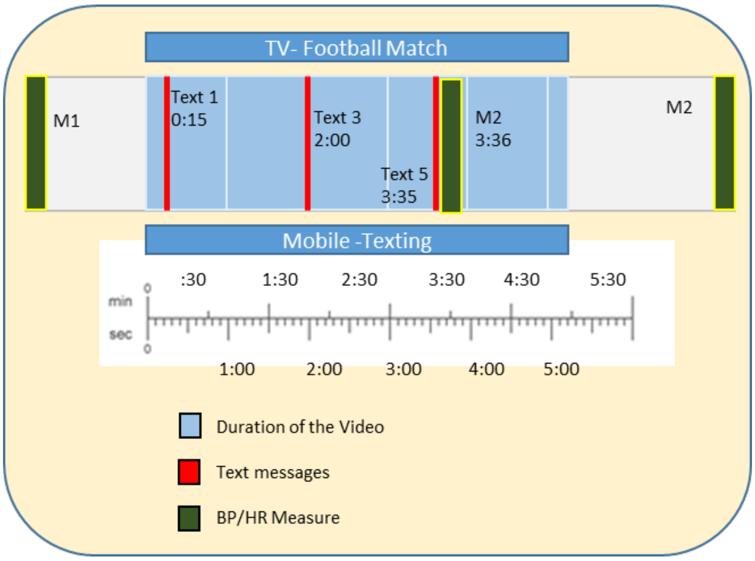
In the first stage of the experiment, the participants were asked to sit and relax for five minutes before the first measure of their heart rate (HR) and then their blood pressure (BP) was recorded. The BP and HR were recorded at predefined stages of the experiment using an inflatable cuff attached to semi-automatic blood pressure (SABP) device (Wetherell and Carter, 2014). The first measure of the BP and HR made the participants familiar with the process and the device. The SABP device's cuff was attached to their non-dominant arm until the end of the stimulus video. After recording the initial reading of BP and HR of the participants, they were randomly assigned to one of the two task conditions. As per their task condition, the participants proceeded to the next stage of the experiment.

4.3.2.2 Task

After being assigned to one of the two conditions, they were given specific instructions as per their condition. The participants in the single-task condition watched the stimuli on TV. The participants in the media multitasking condition used the smartphone in addition to watching the stimuli on TV. The smartphone was unlocked with no passcode for easy access for participants in media multitasking conditions. They were asked to keep the mobile phone in their hands throughout the experiment. To familiarise the participants with the device, they were sent a '*hi'* text message and were asked to reply with the same message to ensure they can operate the device. Their task was to read, reply and click on the links sent to them through text messages by the researcher while watching the stimuli on TV.

The cuff of the SABP device remained attached to the non-dominant arm of every participant to enable the measurement of BP and HR during the task and to allow participants to access their respective smartphones in their dominant hand easily (Gangadgarbatla, et al., 2013). The participants in the media multitasking condition received five text messages at fixed times while watching the stimuli on TV. Three text messages were sent at the exact time mentioned in Table 4.4 and the two follow up texts were sent immediately after receiving a reply from the participants. The second measure of HR and BP was taken after sending the third text, at 3 minutes 45 seconds from the start of the stimuli video. See Figure 4.3 for the timeline of text messages and HR and BP recordings.

Figure 4.3: Experiment Timeline



4.3.2.3 Questionnaire

After watching the TV stimulus, the cuff of the SABP device was removed from the participants' arms. The participants in the media multitasking condition were asked to hand over the mobile device. It was followed by providing a copy of the questionnaire to participants in each condition. The questions were displayed in the following order: filter question, football involvement, fan involvement, free recall, recognition, attention, task difficulty, and demographic variables. The structure of the questionnaire was adapted from Malhotra's handbook of marketing research (2006), which suggests arranging the questions in a logical order. Qualifying questions were asked first (filter questions), followed by football and fan involvement questions as they are easy to answer and generate confidence and cooperation from the respondents. The basic questions (dependent variable) were asked before the classification questions (control variables) as they are a more important aspect of the study. The brand memory questions were asked before the questions on familiarity to avoid the effect of knowing the brand name from the questions. The classification questions (demographic) were asked last as the respondents generally resist them as they collect personal information.

4.3.2.4 Debriefing

In the final part of the study, the completed questionnaires were collected, and the final measure of participants' BP and HR were recorded. Participants were then debriefed about the real purpose of the study and thanked for their participation.

4.4 Participants and their Characteristics

The sample comprised 136 people, which included almost 60% males. The sample comprised of the urban population who own smartphones and TV. There are almost 450 million (34% of the total population of India) people living in the urban areas of India (World Bank, 2019), who have access to watching global and domestic sporting events. While Cricket has the highest viewership in India, Kabaddi and Football are witnessing high growth in their viewership (Scrimgeour, 2019). The Indian sports sector is experiencing a change which can be identified from a stark rise in viewership, broadcasting of different sporting events, performance in sports, and the growth of the Indian sponsorship market (KPMG, 2016). The sports sponsorship in India is steadily growing year after year; for instance, it grew by 12% in 2018 to reach USD 1.03 billion and 17% in 2019 to almost USD 1.20 billion (Lagathe, 2019; Sportstar, 2020). The large proportion of sport sponsorship in India includes endorsement deals of cricketers, on-ground sponsorship and media spending. The media spending increased from USD 460 million in 2016 to USD 590 million in 2018. Similarly, the on-ground sponsorship increased from USD 150 million in 2016 to USD 215 million in 2018.

Most of the sports advertising spending is focused on TV viewers, but the growth in spending on digital mediums is even higher (Sportstar, 2020). Advertising spending on digital mediums grew by 84%, from USD 632 million in 2018 to USD 1.16 billion in 2019 (CampaignIndia, 2020). There are more than 350 million social media users in India (approximately 26% of the total population of 1.35 billion); and they are expected to grow by 27% to 447 million by 2023 (Keelery, 2020). Indian Premier League, an annual cricket league in India that is widely popular, registered 59 million likes on Facebook and 81 million followers on Twitter. The younger generation, aged between 18-24 years, are significant followers, with over 97 million Facebook users in 2018 (Keelery, 2020). With the increased availability of internet access and support from the Indian government's Digital India initiative, the growth in social media users has been on the rise, making India the second-largest market globally after China. India represents both a significant current and future market for sports sponsorship and now with the ever-increasing consumption of multiple media, an understanding of the advertising effectiveness in this market is momentous.

4.5 Measures and Scales

Independent Variables (X)

Task condition (Single-tasking vs Media Multitasking): The participants were randomly assigned to one of the two conditions, either the single-tasking condition where the participants would watch the TV or the media multitasking condition where they would use a mobile phone in addition to watching the TV.

Dependent Variables (Y)

Brand Memory: The memory of the sponsored brands was measured by a sum score of correct answers on four different memory questions. First, they were asked to recall all the brands they saw on the perimeter boards of the football match. Second, they were asked to recall the shirt sponsor of both the teams. Third, the participants were shown a list of twelve brand logos and asked if they could recognise any of these brands from the perimeter boards. Fourth, another list of six brand logos was shown and asked if they could recognise any of the brands as shirt sponsors of either of those teams. The participants were given a score of 1 when they correctly mentioned each target brand and 0 for each incorrect answer (Segijn, 2017).

Other Variables

Attention: The participants designated their attention towards the primary task by reporting their attention paid towards the TV during the experiment. The participants reported their attention on a seven-point scale from paying no attention to a high level of attention. The scale was adapted to a seven-point scale from Jeong and Hwang (2012) and Segijn et al. (2017) who measured attention on a scale from 0 (No attention) to 100 (Full Attention) to maintain the consistency of scales used in the questionnaire. It is recommended to use five to nine-point scales, and the same scale format should be used throughout the questionnaire thus this study used a seven point scale (Brancato et al., 2006).

Difficulty: The participants reported their perception of difficulty in performing their tasks on a seven-item Likert-type scale. The participants were asked, 'how difficult was the task' from no difficulty to a high level of difficulty. This scale has been used by Chung and Monroe (2000) and adapted from Samuelson (1991).

4.6 Results and Analysis

4.6.1 Assumptions

The data analysis of this study tested the differences in the scores of brand memory, attention towards the TV and the self-report of difficulty by an independent t-test. The effects of media multitasking on brand memory and was tested by simple linear regression. The mediation role of difficulty in the relationship of media multitasking and brand memory was tested by the PROCESS computational model given by Hayes (2013). PROCESS is a robust path analysis modelling tool widely used in the fields of marketing and business. It uses ordinary least squares and logistic regression to estimate direct and indirect effects. The importance of using the PROCESS in this study are explained later in the data analysis section.

The above-mentioned data analysis tests are both parametric (regression) and non-parametric (t-tests) and required certain assumptions to be met before testing. The following section illustrates the assumptions for both parametric and non-parametric tests that were considered before the data analysis. There are five major assumptions to be considered (Pallant, 2013):

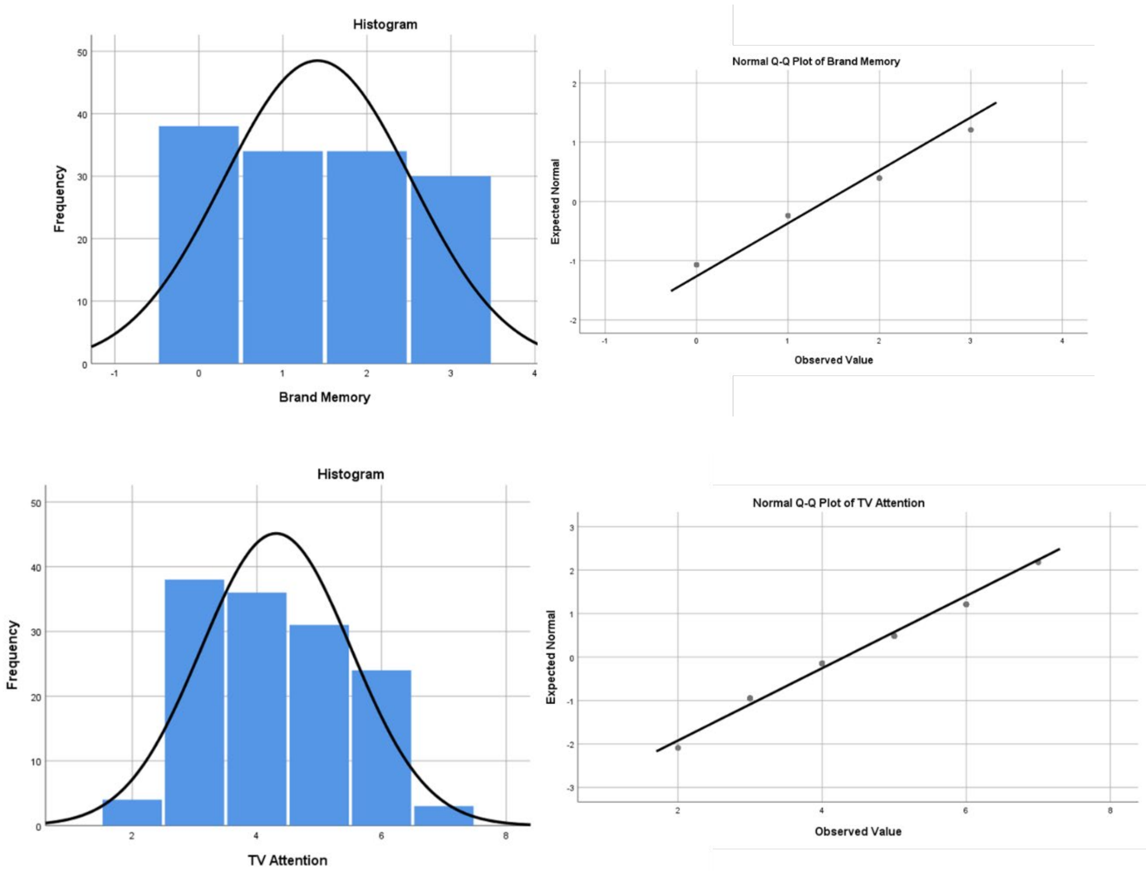
a) Level of Measurement: It is necessary to measure the dependent variable using an interval or ratio level, i.e., that is simply using a continuous scale rather than a discrete scale. All the dependent variables in this study were also measured using a continuous scale. The attention and perceived difficulty were measured using a seven-point scale. The brand memory was calculated by summing up the scores on free recall and recognition. The participant's memory was measured on a scale from 0 to 10. Thus, the assumption of the level of measurement was not violated.

b) Random Sampling: The assumption of random sampling was sustained in this study as the allotment of participants in either condition was based on chance. Participants were asked to roll a dice to be allotted to each media condition. If they got an even number, they were allotted to a single-tasking condition and if they got an odd number, they were allotted to the media multitasking condition.

c) Independent observation: The collected data was independent of one another and was not influenced by another participant or measure. The scores of dependent variables were measured using different scales. The experiment was conducted in a private setting with one participant at one time. There was a buffer of 15 minutes between the end and start of an experiment session. It facilitated no interaction between the participants.

d) Normal Distribution: To conduct a parametric test, it was necessary to check for normality in the distribution of the dependent measures. In this study, the dependent measure was checked for normality using the normality probability plots and histograms. In Figure 4.4, the left side presents the histogram and the right side presents the normality probability plots. The scores of brand memory and attention form a bell shape curve, and on the right side, the data of both the variables closely follow the diagonal line. It can be confirmed that the variables are normally distributed.

Figure 4.4: Study 2A-Normal Distribution of Brand Memory and Attention



e) Homogeneity of Variance: This assumption required the scores of dependent measures to be equally variable between the two conditions. Levene's test was performed to validate the t-test and fulfil the assumption of homogeneity of variance. A significance level of greater than .05 was observed in all four of the dependent variables (Attention towards TV p = .24, difficulty p = .08, brand memory p =.07) and this validated that the assumption of homogeneity of variance has not been violated.

4.6.2 Manipulation Check

Attention towards the secondary device was measured to confirm the media multitasking as intended. The participants in the single-tasking condition only reported attention towards the TV, whereas the participants in media multitasking reported attention towards the TV as well as the smartphone. Similar to reporting attention towards the TV, the participants were asked to report their attention towards the smartphone on a seven-point Likert type scale. They were asked about how much attention did they pay to the mobile, 1= no attention and 7=high level of attention. As anticipated, all the 70 participants in the media multitasking condition reported a high level of attention to the mobile thus confirming the intended manipulation of media multitasking [$\bar{X}$=5.23(1.70)].

The participants' attention towards the TV was significantly different when they were in the single-tasking multitasking (M=5.24, S.D.= .84) as compared to when they are media multitasking (M=3.43, S.D.=.73, t (134)= 13.41, p< .001, two-tailed). This indicates that the participants in the media multitasking condition divided their attention between the mobile and the TV and thus were unable to devote as much attention towards the TV as single-taskers.

4.6.3 Descriptive Statistics

This section provides the descriptive statistic of all the control variables used in the study for both single-tasking conditions as well as the media multitasking condition. The control variables were general demographic questions like age, gender and education qualification, as well as variables that could have had an impact on the dependent variables such as football involvement, fan involvement for both the teams, travel to the

U.K./Europe and English proficiency. One filter question was asked to eliminate familiarity with the stimuli and the brands. The participants were asked if they had seen the stimuli video before the experiment. All the participants answered 'No' to the question and thus were part of the final sample. Before presenting the results of this experiment, Table 4.5 summarises the descriptive statistics for all the control variables.

Table 4.5: Study 2A Descriptive Statistics (Continuous Variables)

Variable	Overall (N=136)	Single-Tasking (N=66)		Media Multitasking (N=70)	
	Mean(SD)	Mean(SD)	Skewness	Mean(SD)	Skewness
Age	33.88 (10.64)	35.15 (11.23)	1.02	32.69 (9.98)	1.02
Football Involvement	3.78 (1.28)	3.81 (1.19)	-.45	3.75 (1.37)	-.288
Marseille Fan Involvement	1.10 (.29)	1.12 (.32)	2.37	1.07 (.25)	3.40
RB Leipzig Fan Involvement	1.08 (.274)	1.09 (.29)	2.91	1.07 (.26)	3.40
English Proficiency	4.96 (1.19)	4.86 (1.23)	.31	5.06 (1.15)	-.81

Table 4.6: Study 2A Descriptive Statistics (Categorical Variables)

Variable	Overall (N=136)	Single-Tasking (N=66)	Media Multitasking (N=70)
	Frequency (%)	Frequency (%)	Frequency (%)
Gender			
Male	81 (59.6%)	43 (65.2%)	38 (54.3%)
Female	55 (40.4%)	23 (34.8%)	32 (45.7%)
Education			
High School	6 (4.4%)	4 (6.1%)	2 (2.9%)
Senior Secondary	26 (19.1%)	8 (12.5%)	18 (25.7%)
Bachelors	20 (14.7%)	10 (15.2%)	10 (14.3%)
Masters	78 (57.3%)	40 (60.6%)	38 (54.3%)
PhD	6 (4.45)	4 (6.1%)	2 (2.9%)
UK/EU Visit			
YES	5 (3.7%)	2 (3%)	3 (4.3%)
NO	131 (96.3%)	64 (97%)	67 (95.7%)

There were more males than females in the sample (Male=59.6%) and the average age of the participants was 33.88 years. The fan involvement and football involvement of the participants were low as was expected. The English proficiency of the sample was high in both the media multitasking conditions [$\bar{X}$=4.96 (1.19)]. More than 70% of the sample had a bachelors degree and more than 50% had masters degree. There were very few people who had visited the UK or Europe in the last three years; more than 96% of the sample had not visited the UK or Europe. An independent t-test was conducted to check for the equal distribution of age (p = .17), football fan involvement (p = .75), Marseille fan involvement (p = .32), RB Leipzig fan involvement (p = .68) and English fluency (p = .34) between the two media conditions. A chi-square analysis was also conducted to check for the distribution of gender (p = .19), education (p = .27), and UK/EU visit (p = .69) between the two conditions. It was found that the above-mentioned variables were equally distributed between the two conditions and thus, were not part of the main analysis as control variables.

4.6.4 The Effect of Media Multitasking

An independent t-test was conducted to test the difference in participants' perception of difficulty and brand memory between the two conditions. This test was appropriate to use in this experiment as it had two experimental conditions and different participants were assigned to each condition (Field, 2013).

There was a significant difference in scores for the above-mentioned variables for participants in the single-tasking and media multitasking. The participants' perception of difficulty was significantly different when they were media multitasking (M=2.62, S.D. = 1.37) as compared to when they were single-tasking (M=1.81, S.D. = 1.17, t(134)= -3.68, p< .001, two-tailed). The perception of difficulty increases when people are media multitasking as compared to when they are single-tasking. Thus, it can be concluded that media multitasking is perceived as more difficult than single-tasking.

There was also a significant difference in the memory of the sponsored brands as reported by the participants in the media multitasking condition (M =.77, S.D. = .87) as compared to single-tasking (M =2.09, S.D.= .94, t(134)= 8.49, *p*< .001, two-tailed).) The brand memory of participants was significantly less in the media multitasking condition as compared to participants in the single-tasking condition.

Table 4.7: Independent Sample t-tests for Single-Tasking (ST) and Media Multitasking (MMT)

Variable	Condition	N	Mean (S.D)	t-value	Sig. (2-tailed)
Difficulty	ST	66	1.81 (1.17)	-3.68	.000
	MMT	70	2.62 (1.37)		
Brand Memory	ST	66	2.09 (.94)	8.49	.000
	MMT	70	.77 (.87)		

4.6.5 Comparing the Effect of Media Multitasking on the Physiology of participants

To compare difficulty between media multitasking and single-tasking, physiological reactivity was measured by recording heart rate and blood pressure of participants at three time intervals- before the task, during the task and after the task for both the media conditions. The difference in the heart rate and blood pressure was analysed using a mixed between-within subjects ANOVA (Analysis of Variance) by comparing the heart rate and blood pressure between the two conditions across the three-time intervals. The statistical test aimed to determine whether there were differences in blood pressure and heart rate between the two conditions and whether there was an interaction between the media conditions and the heart rate and blood pressure.

Cho (2020) and Reckelhoff, (2001) found that there are difference in the heart rate and blood pressure between men and women, and Uchino et al. (2006) have found differences in heart rate and blood pressure between different age groups The effect of education on the blood pressure and heart rate have also been observed, with higher-level education resulting in reduced risk of heart problems (Carter et al., 2019). A randomisation check was conducted on the sample of this study to assess the effect of gender, education qualification and age on blood pressure and heart rate.

An independent t-test was conducted to see if the gender affected the heart rate and blood pressure of participants. There was no difference in the heart rate between males and females in before the task (p =.420) and after the task (p = .116) but there was a significant difference between the heart rate of males and females during the task ($p < .01$). The systolic and diastolic blood pressure was not different for males and females before (Systolic p = .908; Diastolic p = .500), during (Systolic p = .067; Diastolic p = .162), and after (Systolic p = .092; Diastolic p = .331), the task.

A one-way ANOVA was conducted to observe for the difference in the heart rate and blood pressure between education qualifications. It was observed that the heart rate was not different between participants with different education qualification before the task (p = .284), during the task (p = .089) or after the task (p = .300). Similarly, there was no difference in the blood pressure of participants with different education qualification before (Systolic p = .353; Diastolic p = .400), during (Systolic p = .057; Diastolic p = .178), and after (Systolic p = .294; Diastolic p = .295), the task..

The age was also not correlated with higher heart rate in this sample during before (p= .136), during (p = .213) and after (p = .689) the task. It also does not correlate with systolic or diastolic blood pressure between before, during and after the task measurements.

Heart rate and blood pressure were not influenced by age, gender or education qualification of the participants. The mean age in both the condition was not different (p = .903), the males and females were equally distributed in both the conditions (p = .197) and the education qualification of participants were also not different between the two conditions (p = .275). It was observed that participants in the two conditions are similar in their demographic factors and there was no difference in the blood pressure and heart rate due to these factors. Thus, there was no effect of age, gender or education on the heart rate and blood pressure in this sample. In the next section, the effect of media conditions on heart rate is analysed.

4.6.5.1 Effects on Heart Rate

The main effects that resulted in the media conditions show that heart rate scores were significantly different across different times of measurement. Table 4.8 presents the heart rate of each condition at different intervals of measurement. The heart rate increased during the task in both the conditions in comparison with before the task and after the task. Mauchly's test indicated that the assumption of sphericity was not violated, $\chi^2(2)$ =.640, p = .726. There was a significant difference in the participants' heart rate measures at different intervals, the results are reported with Mauchly's assumed sphericity showing a significant effect for heart rate at different intervals ($F(2, 268) = 19.303$, $p < .001$). Partial eta squared η^2= .126 indicates a moderate effect size, which confirms the difference between heart rate before task, during the task and after the task.

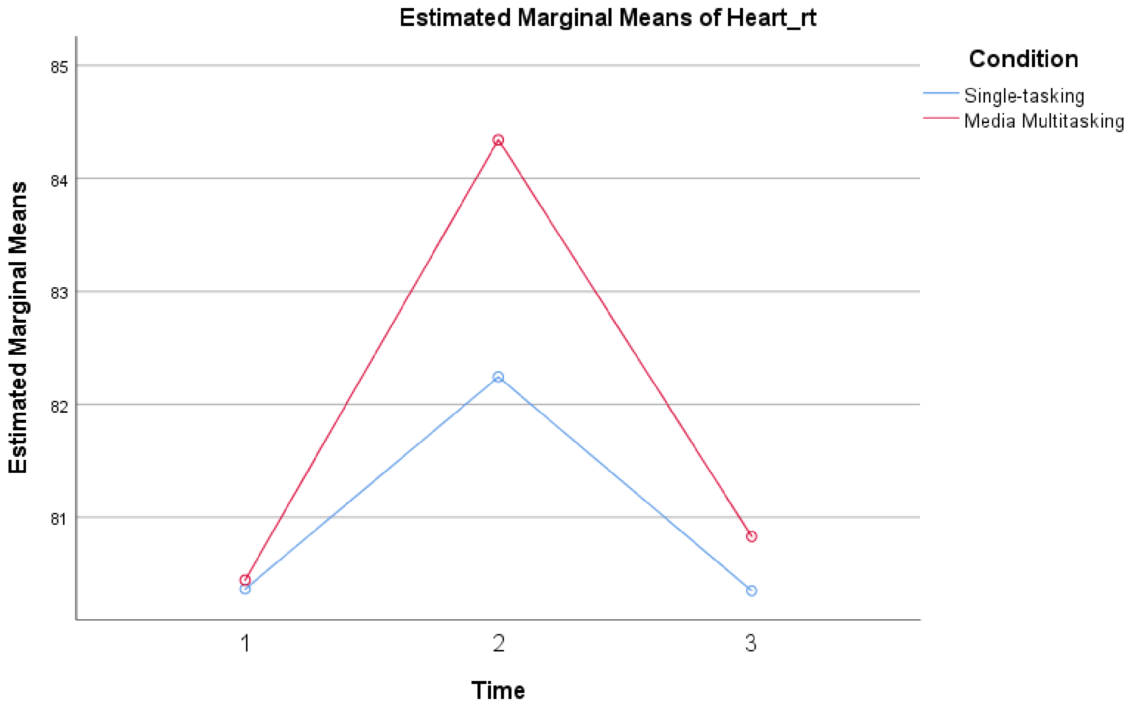
Table 4.8: Study 2A Heart Rate Descriptive

		Heart Rate		
Condition	N	Pre-task	During Task	After Task
Single-tasking	66	80.36 (5.293)	82.24 (5.868)	80.35 (5.655)
Media Multitasking	70	80.44 (5.423)	84.34 (5.838)	80.83 (5.302)
Total	136	80.40 (5.341)	83.32 (5.925)	80.60 (5.461)

Bonferroni's post hoc test was conducted to control for Type 1 error as it is a robust and widely used post hoc procedure (Field, 2013). The difference between the pre-task and during task heart rate was highly significant ($p < .001$), similarly the difference between during task and post-task heart rate was also highly significant ($p < .001$). There was no difference in the pre-task and post-task heart rates. The main effect for the media conditions provided non-significant results ($F(1,134) = 1.427$, $p = .234$, $\eta^2 = .011$). It means that the heart rate differences between the two media conditions were not statistically different.

The interaction effect of media conditions and the heart rate intervals were also insignificant ($F(2,268) = 2.113$, $p = .123$, $\eta^2 = .016$). As can be seen from Figure 4.5, the interaction plot of the means of the three heart rate measure intervals suggests that there is no difference in the pre-task heart rate measures between both conditions. Whereas there was a spike in the heart rate of participants in the media multitasking condition as compared to the single-tasking condition. In the post-task condition, the heart rate of the participants in the media multitasking condition was slightly higher than the participants in the single-tasking condition but not significantly higher. There was not a significant change in the heart rate during media multitasking as compared to single-tasking. The next section examines the effect of media multitasking on blood pressure.

Figure 4.5: Study 2A Change in Heart Rate at different time points



4.6.5.2 Effect on Blood Pressure

Mixed between-within subject ANOVA was conducted to compare the blood pressure measurements between the two media conditions- single-tasking and media multitasking across the three intervals- pre-task, during the task and after the task. The statistical test sought to determine the significance of the main effects on blood pressure measurements between the two media conditions as well as the interaction between the three intervals.

The main effects for different time intervals (pre-task, during task and post-task) showed that systolic and diastolic blood pressures were significantly higher during the task as compared to pre-task and post-task measurements. Mauchly's test indicated that the assumption of sphericity was not violated for both systolic ($\chi^2(2) = 3.793$, $p = .150$) and diastolic (, $\chi^2(2) = 2.977$, $p = .226$). Therefore, the results were reported with assumed sphericity and demonstrate that there was a significant difference in the participants' systolic ($F(2, 268) = 4.56$, $p < .05$) and diastolic ($F(2, 268) = 6.706$, $p < .001$) blood pressure measurements across different times. Partial eta squared for the systolic blood pressure $\eta^2 = .033$ and for diastolic blood pressure $\eta^2 = .048$ indicated a small effects size, which confirmed the difference between the pre-task, during the task and after task blood pressure measurements.

Table 4.9: Study 2A Blood Pressure Descriptive

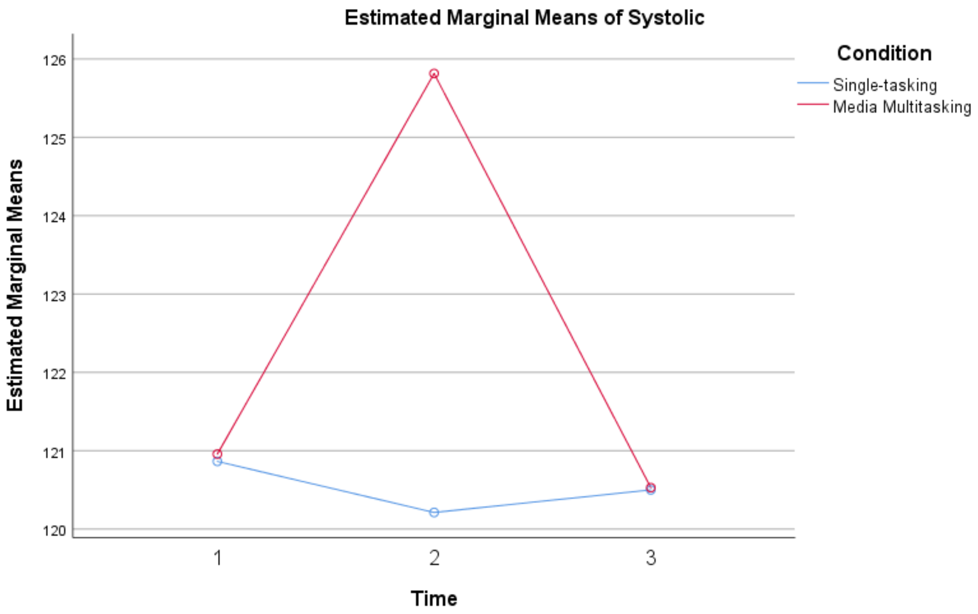
Blood Pressure		**Single-Tasking**	**Media Multitasking**
Pre-Task	Systolic	120.86 (7.905)	120.96 (7.641)
	Diastolic	80.59 (6.530)	80.17 (6.726)
During Task	Systolic	120.21 (9.053)	125.81 (9.200)
	Diastolic	81.39 (6.888)	83.79 (6.274)
Post-Task	Systolic	120.50 (8.662)	120.53 (9.037)
	Diastolic	80.44 (6.940)	80.36 (6.657)

Bonferroni's post hoc test was conducted to control for the Type 1 errors. Pairwise comparison of the systolic blood pressure showed that the difference between the pre-task and during task systolic blood pressure ($p < .05$).; and the difference between the during tasks and post-task systolic blood pressure were significant ($p < .05$). Similarly, the pairwise comparison of the diastolic blood pressure showed that the difference between the pre-task and during task diastolic blood pressure ($p < .05$); and the difference between the during tasks and post-task diastolic blood pressure was also significant ($p < .05$). As expected, there was no difference in the pre-task and post-task systolic and diastolic blood pressure.

The main effect for the media conditions of systolic blood pressure ($F(1,134) = 3.505$, $p = .063$, $\eta^2 = .025$) and diastolic blood pressure ($F(1,134) = .594$, $p = .442$, $\eta^2 = .004$) provided non-significant results. It meant that the blood pressure differences between the two media conditions were not statistically different.

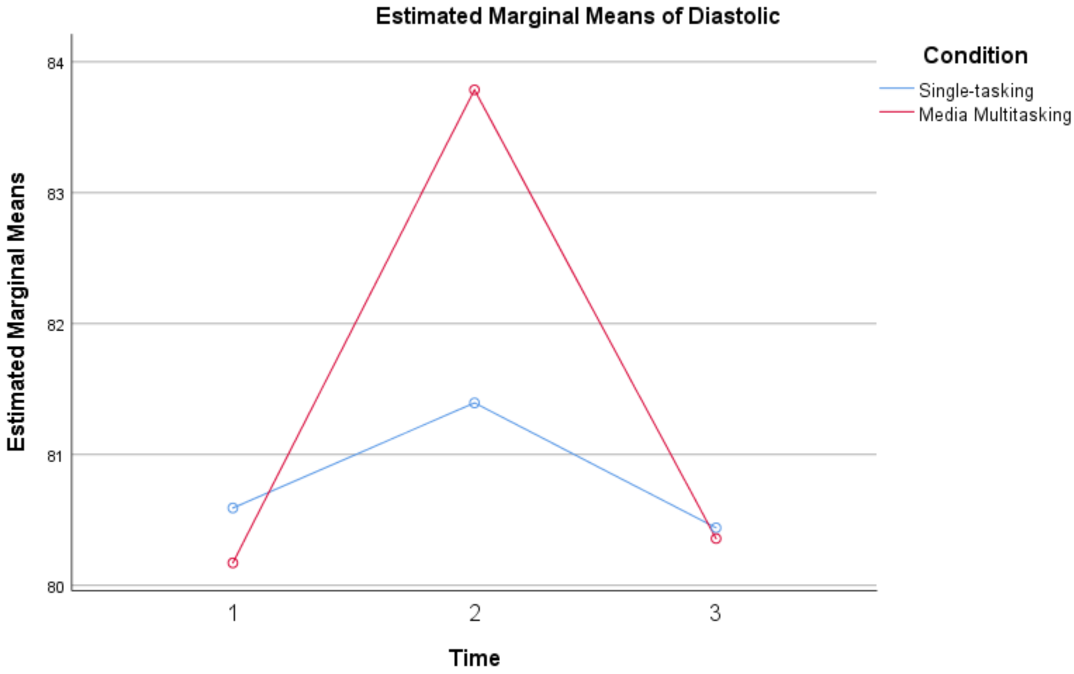
The interaction effect of media conditions and the systolic blood pressure intervals were significant ($F(2,268) = 6.468$, $p < .01$, $\eta^2 = .046$). As can be seen from Figure 4.6, the interaction plot of the means of the three systolic blood pressure measurement intervals suggested that there was almost no difference in the pre-task and post-task systolic blood pressure measurements between both conditions. Whereas there was an increase in the systolic blood pressure of participants in the media multitasking condition as compared to the single-tasking condition. The systolic blood pressure changes in the single-tasking condition were minor as compared to the systolic blood pressure measurement of the media multitasking condition.

Figure 4.6: Study 2A Systolic Blood Pressure at different time points



The interaction effect of media conditions and the diastolic blood pressure intervals were insignificant ($F(2,268) = 2.448$, $p = .088$, $\eta^2 = .018$). In Figure 4.7, the interaction plot of the means of the three diastolic blood pressure measurements intervals indicated that there were no major changes in the diastolic blood pressure between the two conditions. Although there was a much higher increase in the diastolic blood pressure in the media multitasking condition during the task as compared to the single-tasking condition, it was not significant. Overall the diastolic blood pressure in the media multitasking condition changed across the three-time intervals of measurement as compared to a much flatter curve of single tasking's diastolic blood pressure curve.

Figure 4.7: Study 2A Diastolic Blood Pressure at different time points



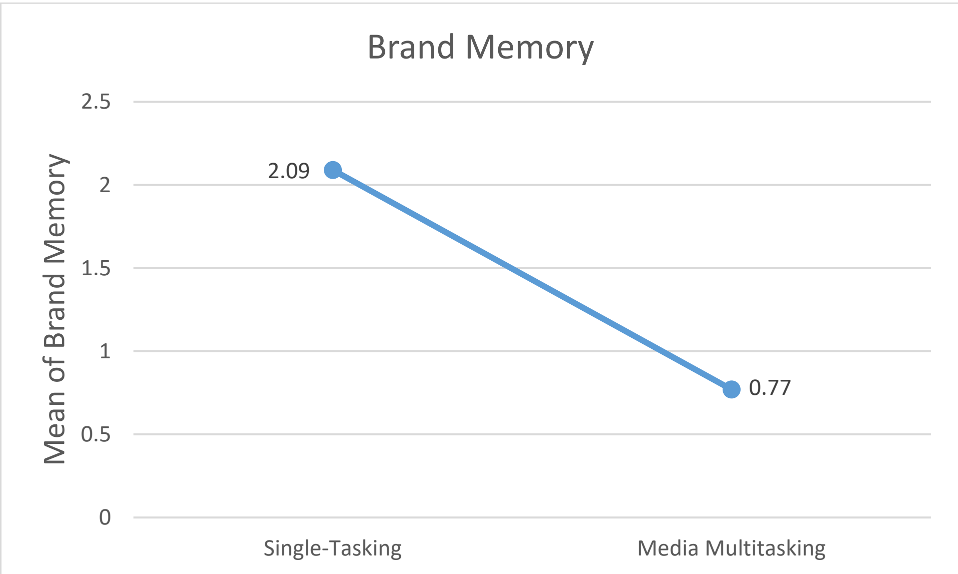
The insignificant change in the systolic, as well as diastolic blood pressure during media multitasking as compared to single-tasking provides evidence to that media multitasking does not increases the blood pressure of the participants. After analysing the physiological differences (heart rate and blood pressure) between the media conditions and within the predefined intervals of measurement, there was not enough evidence to state that media multitasking has a physiological effect on the participants.

Based on the results from the independent t-tests, there was a significant difference in the participants' perception of difficulty between single-tasking and media multitasking. However, the ANOVA results of heart rate and blood pressure do not provide convincing evidence that media multitasking affects the physiology of people. Thus, it can be concluded that people perceive media multitasking as more difficult than single-tasking and therefore H5 is accepted.

4.6.6 The Main Effect of Media Multitasking on Brand Memory

A simple regression analysis was conducted to test the main effect of media multitasking on participants' brand memory for the sponsors in a football match (H6). The results of the simple linear regression revealed that the participants' memory of the sponsors while media multitasking decreased by β = .59 (t =(-8.50, p < .001) units, as compared with their memory of sponsors when they were single-tasking. Figure 4.8 visualises that when switching from single-tasking to media multitasking (i.e., 1 unit of media multitasking difference), the viewers' memory of the sponsored brand reduces by 0.59 units. The R squared – which is a statistical measure that expresses the goodness of fit for the linear model (i.e., how close the data are to the fitted regression line (Malhotra et al., 2002) is R^2 = 35%. It reflected that media multitasking explains a considerable proportion in the variation of viewer's brand memory.

Figure 4.8: Brand Memory difference between Media Multitasking and Single-Tasking



Although quite a few studies have already studied the effect of media multitasking on memory during the past decade (Zhang et al., 2009, Bellman et al., 2012, Srivastav, 2013, Voorveld et al., 2015) and some have also been able to identify the positive effects on memory (Angell et al., 2016). This main effect of MMT in this study results in a decrease in memory, confirming the majority of the previous studies (Jeong and Hwang, 2016). In the next section, the mediation of difficulty (Model 1) on the effect of media multitasking on brand memory is tested.

Model 1: Mediation by Difficulty

The mediation role of difficulty on the impact of media multitasking on brand memory was tested by repeating the above analyses and substituting the attention to TV variable with the perception of difficulty. As Figure 4.9 and Table 4.10 present, participants indicated that when they indulge in media multitasking, their task difficulty increased by .81 units as compared to when they were single-tasking (a = .81). In turn, the participants who found the tasks difficult rather performed better on the memory of the sponsored brands (b = .355). A bias, corrected bootstrap 95% CI for the indirect effect (ab = .287) based on the 10,000 samples was entirely above zero (.122 to .482). Moreover, media multitasking also independently affects brand memory directly (c' = -1.607).

Figure 4.9: Mediation by difficulty, path and results

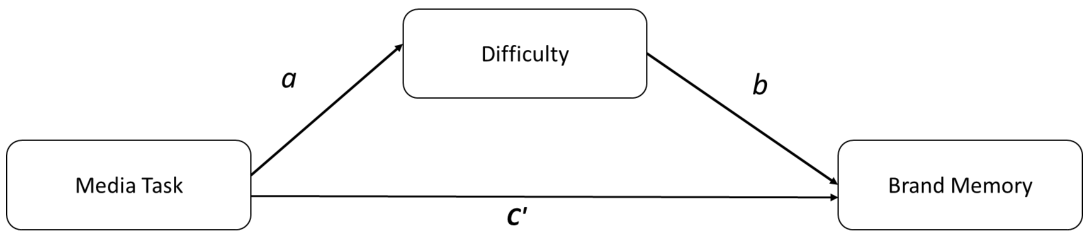


Table 4.10: Mediation Model 1: Direct, Indirect and Total Effects

Path	Coeff.	SE.	t	Sig. (2-tailed)	LLCI	ULCI
c	-1.319	.155	-8.495	.000	2.920	-1.012
a	.810	.219	3.684	.000	.375	1.245
b	.355	.052	6.705	.000	.250	.459
c'	-1.607	.141	-11.363	.000	-1.886	-1.327
a x b	.287	.092			.122	.482

The analysis shows that media multitasking predicts the difficulty in performing the task (F(1,134) = 13.578, p <.001, R^2 = 9.2%), and the media multitasking and difficulty together better explain the participants' memory of the sponsored brands (F(2,133) = 70.410, p <.001, R^2 = 51.4%). As Figure 4.9 presents, the path coefficients (a =.81 and b =.355) were positive, large and highly significant. Although, when controlling for the difficulty, the direct effect (c' = -1.607, SE = .141, t = -11.363, p <.001) of media multitasking on brand memory was also large and highly significant but is negative. The memory of the brands fell due to the media multitasking but with the mediation of difficulty, it increased. While media multitasking, people who perceived their tasks as difficult had a better memory than those, who did not perceive their tasks as difficult. Thus, hypothesis H7 is accepted as difficulty mediates the effect of media multitasking on brand memory. Although, the expected negative effect of difficulty on brand memory was not found.

4.7 Study 2A Summary

An independent t-test was conducted to test hypothesis H5. The assumptions to conduct the t-test were checked and confirmed. Based on the results from the t-test, hypothesis H5 confirms that media multitasking is perceived as more difficult than single-tasking. To understand the effects of media multitasking on the physiology of participants, a mixed between-within subjects ANOVA was conducted to test the effect of media multitasking on participants heart rate and blood pressure. Although there was a slight increase in heart rate and blood pressure of participants in the media multitasking condition, the results did not provide strong evidence that people have a significantly high heart rate and blood pressure when they media multitask as compared to when they single-task. A simple linear regression was conducted to test the negative relation of media multitasking on brand memory. It was confirmed that media multitasking resulted in poor memory of advertised brands, thus providing evidence to accept hypothesis H6. After this, a simple mediation model was used to test the underlying reasons for the effects of media multitasking on brand memory mediated by difficulty. It was revealed that difficulty partially mediated the effect of media multitasking on brand memory, accepting hypothesises H7.

In a real-world media multitasking simulation, the participants were shown football match highlights on a TV screen and provided with a smartphone to chat with the researcher whilst they were watching a football match. The memory of the sponsors of the perimeter was tested. Through a quantitative empirical investigation, this research illustrates that media multitasking results in decreased brand memory via increased difficulty. The effects of media multitasking have been further explored by examining its physiological effects on the human body. The slight increase in heart rate and blood pressure does indicate a toll on the human body caused by media multitasking. This study contributes to the media multitasking literature in the context of advertising as well as health sciences.

To provide stronger evidence in the effect of media multitasking on the memory of the sponsored advertisements mediated by difficulty and to support the causality of Study 2A's findings, Spencer et al. (2005) experimental causal chain design approach will be used in the second part of this study. In study 2B, the difficulty in media multitasking will be manipulated and its effect on the memory of the advertisements will be tested.

STUDY 2B

4.8 Overview

Results of the previous study (2A) provide evidence that difficulty mediates the relationship between media multitasking and brand memory. Participants reported a positive effect on their memory via increased difficulty while media multitasking. Media multitasking reduced the memory of brands in total effect, but when people found the task difficult, they were able to remember the brands more than people who did not find it difficult.

If the findings of the previous experiment are to be aligned with Wicken's (1984) multiple resource theory, it will be appropriate to say that the two tasks in the previous study did not share their pool of resources. MRT also asserts that the performance of both tasks does not suffer when performed simultaneously. Unfortunately, the performance of the second task and the exclusivity of the resource pool between the two tasks were not considered in the previous study.

Study 2B was conducted for a more in-depth understanding of the role of difficulty and its relationship between media multitasking and brand memory. It followed Spencer et al.'s (2005) method of the mediation process, which is considered superior to Baron and Kenny's (1986) mediation process when examing psychological processes (Mostafa and Bottomley, 2020). They suggest that when the proposed process is easy to manipulate and measure, an experimental-causal chain design should be adopted. Each link in the process (mediator) should be first measured and then in the next experiment should be manipulated as a predictor. In the previous study (2A), difficulty was measured in the mediation process using a self-report scale, and in this study (2B) it was manipulated to confirm the mediation process between media multitasking and brand memory.

The exclusivity of resources between the multiple tasks and their performance was tested to address the limitations of the previous study. The task difficulty can be distinguished into physical and mental difficulty (Hart and Staveland, 1988). According to Hart and Staveland, people evaluate the difficulty of tasks and their impact on their physical and mental state. This evaluation of the task difficulty provides information about the workload for the human body to allocate corresponding physical and mental resources to perform the task. In study 2B the difficulty of the tasks was manipulated by doing physically or cognitively difficult tasks. The difficulty manipulation was useful to differentiate the resources required in the difficult task to address one of the cavities of study 2A. The memory of the content on the primary task (TV) was measured in study 2A as a performance indicator while media multitasking. In study 2B, the memory of the content on the secondary task (mobile) was also measured. It facilitated the comparison between the performances on both the tasks and tested the MRT theory thoroughly.

The media multitasking literature provides little evidence of differences in physical or cognitive difficulty and their effect on the memory and processing of information.

However, the application of Wicken's (1984) multiple resource theory provides a substantial base to hypothesise that people faced with a physically difficult condition will have a better memory of advertisements as their difficult task will not draw the resources available for processing of information. Whereas, the people in the cognitive difficulty condition will do poorly in the testing of memory as their difficulty will draw resources from their limited pool of resources for the processing of information. The measure of blood pressure and heart rate as physiological indicators of the workload are also recorded and analysed to better understand the impact of drawing extra resources.

4.9 Stimuli and Procedure

Study 2B used the same stimuli as that used in study 2A to simulate media multitasking. Football match highlights were used as a stimulus on TV, and texting on a smartphone was used to manipulate media multitasking. A banner advertisement was included on the webpage of the interactive link that was sent as the fifth text message to measure the brand memory of the secondary task. This study made use of the advertisements on the TV as well as on the smartphone. The study used a single factor design with three media multitasking conditions (physically difficult or cognitively difficult or normal/non-difficult). The participants were randomly allocated to one of the three media multitasking conditions. The physiological measures were recorded at the same time intervals as in study 2A.

In the physically difficult condition, the participants were asked to use their non-dominant hand for texting during media multitasking. The use of the non-dominant hand exerts increased physical difficulty in the task involving the use of hands (de Oliveira, et al., 2017). In the study conducted by de Oliveira et al. (2017), the use of the non-dominant hand to operate the mouse of a computer in a tracking task increased the difficulty of the task. The participants in this study were required to wear a cotton glove on their dominant hand to restrict its use and make the use of only the non-dominant hand while media multitasking.

Participants in the cognitively difficult condition were required to do a cognitively difficult task before the multitasking activity. The cognitive difficulty was manipulated by using the regulatory-depletion task method (Baumeister, et al., 1998). Participants are provided with a self-control task which leads to an increase in the difficulty of the follow-up task. Each participant in this condition was provided with a sheet of paper comprised of meaningless text (a page from an article in the Internation Journal of Heat and Fluid Flow, (Panão & Radu, 2013)) on it and told to cross off all instances of the letter *e.* The print of the text from the article was lightened to make it more difficult to read and thus to require more attention from participants. Multiple rules were given to cross off the letter *e* to make it even more difficult for the participants. For instance, they were only required to cross-off the letter *e* if it was not adjacent to another vowel or an extra letter away from another vowel.

In the normal media multitasking condition, there was no manipulation of difficulty. This condition was the same as the media multitasking condition of the previous study, which included watching TV and using the smartphone without any restriction of using their choice of hand for texting.

This study again followed the process-disassociation procedure to eliminate memory bias by providing a pseudo-objective of the study to the participants (Jacoby, 1991; Shapiro & Krishnan, 2001). The participants were told that the objective of the study was to examine the physiological reaction to a football match while using a mobile phone. The study followed the same procedure as in study 2A, the same exclusion criteria for people with hypertension illness, pregnancy or anxiety disorders were applied since their blood pressure and heart rate variability would be different from other participants (Singh, et al., 1998; Solanki, et al., 2020). The qualified candidates were asked to refrain from smoking, eating or drinking 1 hour prior to the arrival for the experiment since the mentioned activities increase variability in the physiological indicators such as heart rate and blood pressure (Wetherell, et al., 2006). The experiment followed the same process of the study 2A, which is as followed:

- Introduction

  The participants were asked to sit in a comfortable armchair for five minutes and were then provided with an informed consent form to sign. After signing the informed consent form, the SABP machine's cuff was attached to the participant's dominant hand and the participants' first measure of heart rate and blood pressure was recorded. This helped in maintaining the pseudo-study deception and also helped in measuring the physiological effect of multitasking. After the first measure of the heart rate and blood pressure, the participants were randomly allotted to the media multitasking condition by a throw of a dice.

- Multitasking

  After being allotted to the respective experimental condition, the participants received manipulation tasks as per their condition. Participants in the media multitasking did not receive any difficulty manipulation and watched the TV while using the smartphone for texting. In the physical-difficulty condition, the participants were provided with a cotton glove and given the instructions to wear the glove on their dominant hand and use the smartphone using their non-dominant hand. Whereas, in the cognitive-difficulty condition, the participants did the difficult regulatory-depletion task before the media multitasking activity of watching the TV and using the smartphone. The participants in the cognitive-difficulty condition were not restricted by the use of any hand to operate the smartphone for texting. The text messages were the same and sent at the same time as in the first study. The second heart rate and blood pressure measure were recorded at the same time as in the first study for the participant in all three conditions at 3 minutes 45 seconds from the start of the video.

The media multitasking was the same for each condition except the physically difficult condition participants who used their non-dominant hand to use the smartphone for texting. The cuff of the SABP machine was attached to the non-dominant hand of the participants in the normal media multitasking and cognitively difficult condition. In the physically difficult condition, the cuff was attached to the dominant hand of the participants. Previous researches have shown that there is a difference in the blood pressure values between the two arms (Orme et al, 1999; Lane et al., 2002). The major limitation of the previous researches is that they have focussed on inter-arm blood pressure differences on a sample of older adults with underlying diseases (Clarke et al., 2006;). Recent researches have overcome this limitation by focussing on a younger sample and has found that there is no statistical difference in the blood pressure values of the dominant and non-dominant hand, irrespective of left or right-hand dominance in young and healthy adults (Mayrovitz, 2019). Another study found no difference between the blood pressure measures between the two arms of young and healthy Israel Air Force applicants (Grossman et al. 2013). The sample of this study is also young and with no underlying health conditions. Thus, it is assumed that there will be no difference in the blood pressure of cognitively and physically difficult conditions.

- Questionnaire

  After watching the TV stimulus, the cuff of the SABP device was removed from the participants' arms. The participants were asked to hand over the researcher's mobile device, and then a copy of the questionnaire to participants in each condition was provided. The questions were displayed in the following order: filter question, football involvement, fan involvement, free recall, recognition, attention, task difficulty, and demographic variables.

- Debriefing

  In the final part of the study, the completed questionnaires were collected and the final measure of participants' BP and HR were recorded. Participants were then debriefed about the real purpose of the study and were thanked for their participation.

4.10 Participants and Characteristics

A total of 144 students and staff from Jamia Millia Islamia, Delhi, were randomly assigned to either of the three media multitasking conditions. The participants were healthy individuals with no medical ailments and were 18 years of age or over. The sample was an urban population who are regular smartphone users, everyday TV viewers and susceptible to media multitasking regularly. The sample was relatively homogenous in terms of intelligence (education), enabling the results of the experiment to be only affected by the stimulus's manipulation.

4.11 Measure and Scales

Study 2B used the same materials/scales as study 2A with some minor differences or adjustments, as highlighted below.

Independent Variable

- Multitasking condition (Media multitasking condition vs physically-difficult condition vs cognitively-difficult condition): The participants in study 2B were randomly assigned to one of the three conditions in the same way as in study 2A.

Manipulation Check

- The participants indicated on a seven-point Likert scale (where 1= Not at all and 7= High level) the extent to which they consider the level of difficulty in media multitasking. This scale has been adapted from the measure of task difficulty used by Chung and Monroe (2000) and Samuelson (1991). Chung and Monroe (2000) conducted a study by manipulating the difficulty perception and measured the effectiveness of the manipulation by asking the subjects on a seven-point Likert scale

(1=Very difficult; 7=Not al all difficult). Samuelson (1991), in his study checked the manipulation of a difficult auditing task by a Likert scale anchored by 1= Not at all difficult to 9= Extremely difficult. It was used to measure perceived task difficulty.

Dependent Variables

- TV Brand memory: The memory of the sponsored brands was measured by a sum score of correct answers on four different memory questions. The brand memory was calculated in the same way as it was done in study 2A.

- Mobile Brand Memory: The memory of the advertisement appearing on the mobile was measured using two items. First, they were asked to recall the name of the brand appearing on the interactive quiz they took during the activity. Second, they were asked to recognise the logo of the banner advertisements from a group of 3 brand logos. A score of 1 was given for the correct answer on each question and a zero on an incorrect answer. This scale is inspired by the scale used by Segijn et al., (2017) to measure the memory of TV advertisements.

4.12 Results and Analysis

4.12.1 Assumptions

The data analysis of this study tested the differences in the scores of TV brand memory, mobile brand memory and attention towards the TV and the attention towards the mobile between the three conditions using a one-way ANOVA t-test. The effects of difficulty in media multitasking on TV brand memory and mobile brand memory were tested by simple linear regression. The physiological effects of difficulty in media multitasking were compared by a mixed between-within subjects ANOVA. The above-mentioned data analysis tests were both parametric (regression) and non-parametric (ANOVA, Mixed ANOVA) and required certain assumptions to be met before testing. The following section illustrates the assumptions for both parametric and non-parametric tests that were considered before the data analysis. There are five major assumptions to be considered (Pallant, 2013):

Level of Measurement: It is necessary to measure the dependent variable using an interval or ratio level, i.e., that is simply using a continuous scale rather than a discrete scale. All the dependent variables in this study were measured using a continuous scale. The perceived difficulty as a manipulation check was measured using a seven-point scale. The TV and mobile brand memory was calculated by summing up the scores on unaided recall and recognition. Mobile brand memory was also calculated by summing up the scores on free recall and recognition. Thus, the assumption of the level of measurement is not violated.

a) Random Sampling: The assumption of random sampling is sustained in this study as the allocation of participants in different media conditions was based on chance. Participants were asked to roll a dice to be allotted to each media condition. If they got (1,4) numbers, they were allotted to non-difficulty media multitasking conditions, if they got (2,5) numbers, they were allotted to the physically difficult media multitasking condition, and if they got (3,6) numbers, they were allocated to cognitive-difficult media multitasking condition.

b) Independent observation: The collected data was independent of one another and was not influenced by another participant or measure. The experiment was conducted in a private setting with one participant at one time. There was a buffer of 15 minutes between the end and start of an experiment session which facilitated no interaction between the participants.

c) Normal Distribution: To conduct a parametric test, it is necessary to check for normality in the distribution of the dependent measures. In this study, the dependent measures were checked for normal distribution using graphs. Figure 4.10 presents that each of our dependent variables' normality through histograms and probability plots. It is evident that Brand memory and Mobile memory do not form the perfect bell shape curve but the probability plots of both the variables are closely following the diagonal line, which demonstrates that the residuals are normally distributed. Thus, the assumption of a normal distribution is not violated.

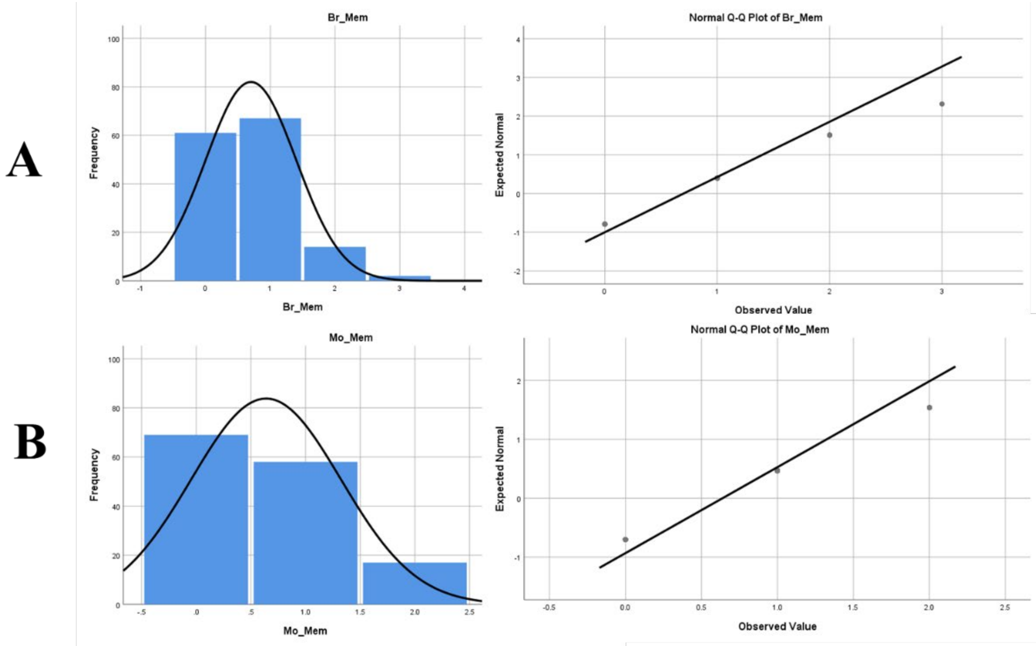


Figure 4.10: **Study 2B-**Normal Distribution of Brand memory of TV (A), Mobile memory (B)

d) Homogeneity of Variance/ Homoscedacity: This assumption required the scores of dependent measures to be equally variable between the two conditions. Levene's test would be performed to validate the t-test and fulfil the assumption of homogeneity of variance. A significance level of greater than .05 was observed in all three of the dependent variables (Difficulty p = .73, Brand memory of TV p =.23 and Mobile brand memory p= .32) and this validates that the assumption is of homogeneity of variance has not been violated.

4.12.2 Descriptive Statistics

This section provides the descriptive statistic of all the control variables used in the study for all three multitasking conditions, media multitasking, physically-difficult media multitasking and cognitively-difficult media multitasking. The control variables were the same as those used in study 2A, demographic questions on age, gender and education qualification, as well as variables that could have had an impact on the dependent variables such as football involvement, fan involvement for both the teams, travel to the U.K./Europe and English proficiency. One filter question was asked to eliminate familiarity with the stimuli and the brands. The participants were asked if they had seen the stimuli video before the experiment. All the participants answered 'No' to the question and therefore were made part of the final sample. Before presenting the results of this experiment, Table 4.11 summarises the descriptive statistics for all the control variables.

Table 4.11: Study 2B Descriptive Statistics (continuous variables)

Variable	N= (144)	MMT(N = 47)		PDMM (N = 49)		CDMM (N = 48)	
	Mean	Mean (SD)	Skewness	Mean (SD)	Skewness	Mean (SD)	Skewness
Age	26.38 (4.65)	26.83 (5.06)	1.62	26.20 (4.88)	1.93	26.10 (4.07)	.585
Football Involvement	3.13 (1.32)	3.30 (1.14)	.51	2.98 (1.43)	.58	3.11 (1.39)	.52
Marseille Fan Involvement	1.26 (.55)	1.15 (.55)	4.15	1.35 (.56)	1.38	1.27 (.53)	1.89
RB Leipzig Fan Involvement	1.44 (.89)	1.43 (.95)	2.21	1.47 (.91)	1.79	1.42 (.84)	1.92
English Proficiency	5.45 (1.07)	5.64 (.89)	.22	5.47 (1.17)	-.92	5.25 (1.01)	-.82

Table 4.12: Study 2B Descriptive Statistics (categorical variables)

Variable	N = (144)	MMT (N = 47)	PDMT (N = 49)	CDMT (N = 48)
	Frequency (%)	Frequency (%)	Frequency (%)	Frequency (%)
Gender				
Male	70 (48.6)	27 (38.6)	23 (32.9)	20 (28.6)
Female	74 (51.4)	20 (27)	26 (35.1)	28 (37.8)
Education				
High School	3 (2.1)	0 (0.00)	2(66.6)	1 (33.3)
Senior Secondary	25 (17.3)	9 (36)	7 (28)	9 (36)
Bachelors	39 (27.1)	19 (48.7)	11 (28.2)	9 (23.1)
Masters	71 (49.3)	19 (26.8)	25 (35.2)	27 (38)
PhD	6 (4.2)	0 (0.0)	4 (66.6)	2 (33.3)
UK/EU Visit				
YES	18 (12.5)	6 (33.3)	5 (27.8)	7 (38.9)
NO	126 (87.5)	41 (32.5)	44 (34.9)	41 (32.5)

There were more females than males in the sample (Female=51.4%) and the average age of the participants was 26.38 years. The fan involvement and football involvement of the participants were as expected low. The English proficiency of the sample was high in all three media multitasking conditions. More than 75% of the sample, had a bachelors degree and almost 50% also had their masters degree. There were very few people who had visited the UK or Europe in the last three years; more than 87% of the sample had not visited the UK or Europe. A one-way ANOVA was conducted to check for the equal distribution of age (p = .71), football fan involvement (p = .51), Marseille fan involvement (p = .20), RB Leipzig fan involvement (p = .95) and English fluency (p = .20) among the three media conditions. A chi-square analysis was also conducted to check for the distribution of gender (p = .29), education (p = .14), and UK/EU visit (p = .80) between the two conditions. It was found that the above-mentioned variables were equally distributed between the two conditions and thus, were therefore not part of the main analysis as control variables.

The correlation matrix of the dependent and independent variables is presented in Table 4.13

Table 4.13: Study 2B Correlation Matrix

	Difficulty	Attention Mobile	Attention TV	Brand Memory TV	Brand Memory Mobile
Difficulty	1	.055	-.100	.193*	-.001
Attention Mobile		1	-.002	.005	.199*
Attention TV			1	.227**	.161
Brand Memory TV				1	.604**
Brand Memory Mobile					1

*Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

4.12.3 Manipulation Check

A one way ANOVA was conducted to verify the manipulation of difficulty in the three media multitasking conditions. Indeed, the participants perceived the two media multitasking presentations as difficult and discriminant ($F(2) = 26.73$, $p < .001$) from the non-difficult media multitasking condition. A Tukey post hoc test revealed participants in the physical difficulty ($\bar{X} = 4.27$, S.D.= 1.07) and cognitive difficulty ($\bar{X} = 4.17$, S.D.= 1.16) reported higher difficulty as compared to the non-difficult media multitasking ($\bar{X} = 2.78$, S.D.= 1.08). There was no statistically significant difference between the physical and cognitive difficult conditions ($p = .90$). It means that physically and cognitively difficult conditions were not statistically different from each other in terms of perceived difficulty.

As anticipated, all the media multitasking conditions reported a similar level of attention towards the TV and the mobile. A one way ANOVA was conducted to verify the attention levels of participants in all three media multitasking conditions. It was revealed that there was no significant difference in attention towards the TV ($F(2) = 1.32$, $p = .26$) and the attention towards the mobile phone ($F(2) = .426$, $p = .654$) among the three media multitasking conditions. The self-reported difficulty and the attention scores of the three media multitasking conditions for both the devices are reported in Table 4.14

Table 4.14: Study 2B Manipulation Check

Variable	Media Multitasking		Physically Difficult Media Multitasking		Cognitively Difficult Media Multitasking	
	Mean	SD.	Mean	SD.	Mean	SD.
Difficulty	2.78	1.09	4.27	1.07	4.17	1.16
Attention TV	3.36	.99	3.51	.98	3.19	.96
Attention Mobile	4.53	1.61	4.47	1.29	4.73	1.41

4.12.4 Effect of Difficulty on Physiology

The effect of media multitasking on the physiology of participants was measured in the same way as in study 2A. The difference in the heart rate and blood pressure was analysed in the same way as study 2A, using mixed between-within subjects ANOVA. The objective of the analysis was to compare the heart rate and blood pressure among the three media multitasking conditions across the three-time points. A randomisation check was conducted to test whether the gender, education or age factors had an impact on heart rate and blood pressure during the three-time points.

An independent t-test was conducted to check for the effect of gender on the heart rate and blood pressure during the three-time intervals. The results show that there was no effect of gender on the heart rate before (p = .221), during (p = .240) and after (p = .327) the tasks. The systolic and diastolic blood pressure was not different for males and females before (Systolic p = .508; Diastolic p = .261), during (Systolic p = .207; Diastolic p = .709), and after (Systolic p = .610; Diastolic p = .160), the task.

A one-way ANOVA was conducted to observe the difference in the heart rate and blood pressure between education qualifications. It was observed that the heart rate was not different between participants with different education qualifications before the task (p = .856), during the task (p = .451) or after the task (p = .927). Similarly, there was no difference in the blood pressure of participants with different education qualification before (Systolic p = .107; Diastolic p = .857), during (Systolic p = .658; Diastolic p = .949), and after (Systolic p = .173; Diastolic p = .218), the task.

Age was not correlated with heart rate or blood pressure between all three-time intervals. Age, gender and education qualification do not influence the heart rate and blood pressure of the participants. The mean age was not different among the three media multitasking conditions (p = .715). The males and females were equally divided among the three media multitasking conditions (p = .294) and the participants had similar education qualifications between the three conditions (p = .146). The participants in the three media multitasking conditions were similar in age, gender and education and had no differences in heart rate and blood pressure due to age, gender or education. Thus, it is observed that the effects on heart rate and blood pressure were not due to any of the factors mentioned above.

4.12.4.1 Effect on Heart Rate

The main effects of mixed between-within subjects ANOVA results showed that heart rate was significantly different across the three pre-defined times of measurement. Table 4.15 presents the heart of the three media multitasking conditions at three different time intervals. The heart rate increased in the second measurement in all three conditions, which was during the media multitasking. The heart rate was similar in the first and third measurement in all three conditions, which were before the start and after the end of the experiment. Mauchly's test indicated that the assumption of sphericity was not violated, $\chi^2(2)$ =.5.191, p = .075. There was a significant difference in the participants' heart rate at different intervals, the results are reported with Mauchly's assumed sphericity showing a significant effect for heart rate at different intervals ($F(2, 282) = 108.685$, $p < .001$). Partial eta squared $\eta^2 = .435$ indicates a large effect size, which confirms the difference between heart rate before task, during the task and after the task.

Table 4.15: Study 2B Mean and Standard Deviation of Heart Rate

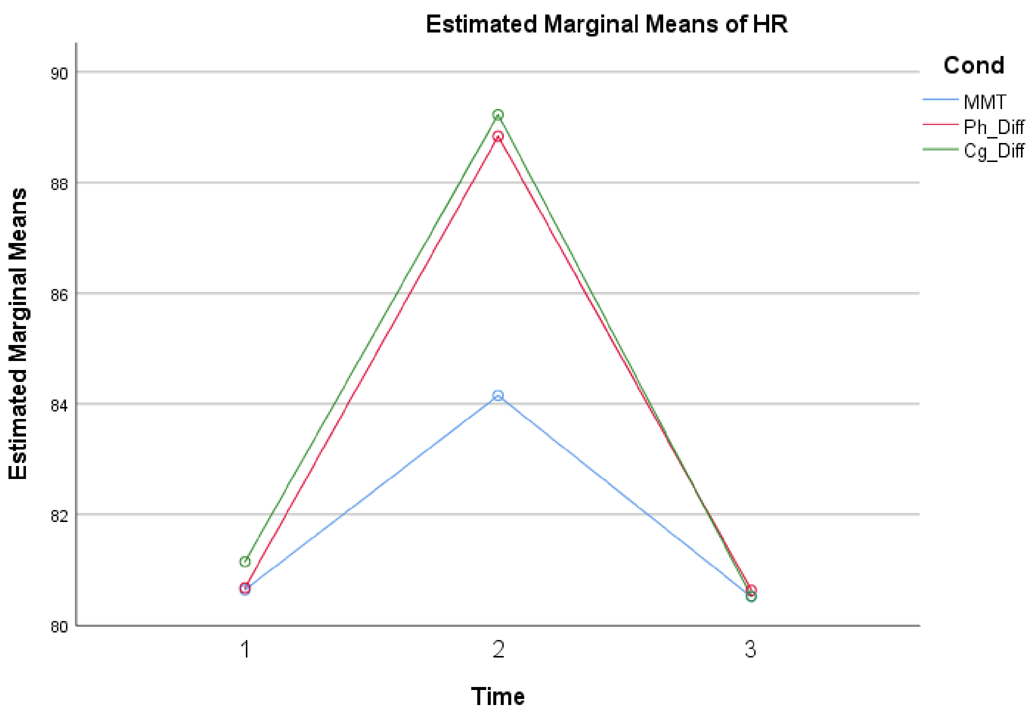
		Heart Rate		
Condition	N	Pre-task	During Task	After Task
Non-Difficult	47	80.64 (5.655)	84.15 (5.401)	80.51 (5.225)
Physically Difficult	49	80.67 (5.994)	88.84 (5.789)	80.63 (5.259)
Cognitively Difficult	48	81.15 (5.816)	89.23 (5.965)	80.52 (5.820)
Total	136	80.82 (5.790)	87.44 (6.135)	80.56 (5.404)

Based on the Bonferroni post hoc test, the difference between the pre-task and during the task heart rate was highly significant ($p < .001$), similarly the difference between the during tasks and post-task heart rate was also highly significant ($p < .001$). There was no difference in the pre-task and post-task heart rates.

The main effect for the media conditions provided non-significant results ($F(2,141) = 2.586$, $p = .079$, $\eta^2 = .035$). It means that the heart rate between the three difficult media multitasking conditions was not statistically different.

The interaction effect of media conditions and the heart rate intervals were significant ($F(2,282) = 5.947$, $p < .001$, $\eta^2 = .078$). Figure 4.11 presents the interaction plot of the means of the three heart rate measure intervals. Although there was no difference in the pre-task heart rate measures between the three conditions, there was a higher increase in the heart rate of participants in the physical and cognitive difficult media multitasking condition as compared to non-difficult media multitasking condition. In the post-task condition, the heart rate of the participants in all three media multitasking conditions was very similar. The significant difference in the heart rate of the physically and cognitively difficult media multitasking during the tasks from the non-difficult media multitasking provides strong evidence to support both the conditions had a stronger effect on the physiology than the non-difficult condition. The next section will examine the effect of difficulty on blood pressure.

Figure 4.11: Interaction plot for the means of the three conditions (Physically difficult, Cognitively difficult and non-difficult media multitasking) and heart rate at three different time intervals (pre-task, during task and post-task)



4.12.4.2 Effect on Blood Pressure

Mixed between-within subject ANOVA was conducted to compare the blood pressure measurements between the three difficult media multitasking conditions across the three-time intervals. The statistical test aimed to find whether the main effects of blood pressure between the three conditions as well as the interaction between conditions and time intervals is significant. The systolic and diastolic measurements were recorded and analysed.

The main effects' results for different time intervals (pre-task, during task and post-task) show that systolic and diastolic blood pressures were significantly higher during the task as compared to pre-task and post-task measurements. Mauchly's test indicated that the assumption of sphericity was not violated for both systolic ($\chi^2(2) = 2.869$, $p = .238$) and diastolic (, $\chi^2(2) = 2.656$, $p = .265$). Therefore, the results were reported with assumed sphericity and demonstrate that there was a significant difference in the participants' systolic ($F(2, 282) = 49.104$, $p < .001$) and diastolic ($F(2, 282) = 47.267$, $p < .001$) blood pressure measurements across different times. Partial eta squared for the systolic blood pressure $\eta^2 = .258$ and for diastolic blood pressure $\eta^2 = .251$ indicated a large effects size, which confirmed the difference between the pre-task, during the task and after task blood pressure measurements.

Table 4.16: Study 2B Means of Systolic and Diastolic Blood Pressure between Three Multitasking Conditions

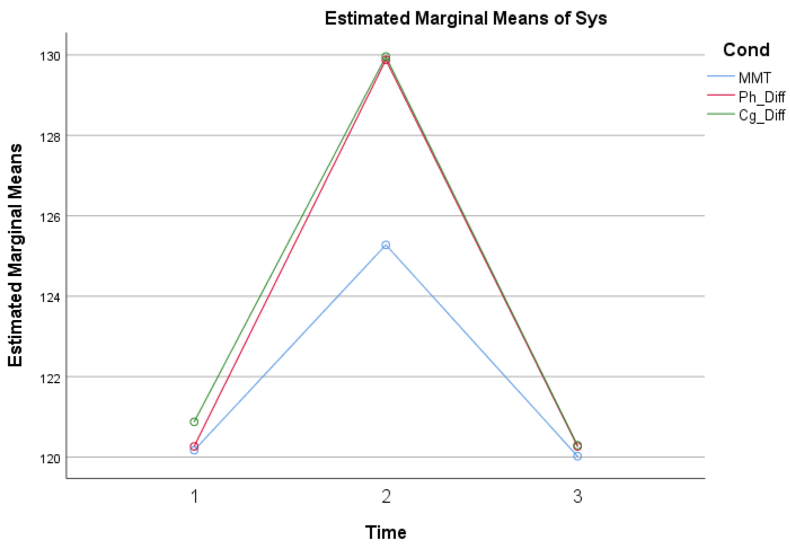
Blood Pressure		**Non-Difficult**	**Physical Difficult**	**Cognitive Difficult**
Pre-Task	Systolic	120.17 (7.308)	120.27 (7.826)	120.87 (7.082)
	Diastolic	80.19 (6.049)	80.88 (7.026)	80.63 (6.564)
During Task	Systolic	125.28 (10.711)	129.88 (9.335)	129.96 (10.619)
	Diastolic	84.09 (7.890)	87.04 (6.865)	87.37 (7.491)
Post-Task	Systolic	120.02 (9.396)	120.27 (8.965)	120.29 (9.469)
	Diastolic	80.06 (6.469)	80.29 (6.876)	80.42 (6.535)

Bonferroni post hoc test was conducted to control for the Type 1 errors. A pairwise comparison of the systolic and diastolic blood pressure was analysed. It showed that the difference between the pre-task and during task systolic blood pressure was significant ($p < .001$) and the difference between systolic blood pressure during the task and post the task was also significant ($p < .0001$). Similarly, the difference between the pre-task and during task diastolic blood pressure was also significant ($p < .001$), and the difference between the diastolic blood pressure, during the tasks and post the task was also significant ($p < .001$). There was no difference in the pre-task and post-task systolic and diastolic blood pressure.

The main effect for the media conditions of systolic blood pressure ($F(2,141) = 1.263$, $p = .286$, $\eta^2 = .018$) and diastolic blood pressure ($F(2,141) = 1.250$, $p = .290$, $\eta^2 = .017$) provided non-significant results. It means that the blood pressure differences between the three difficult media multitasking conditions were not statistically different.

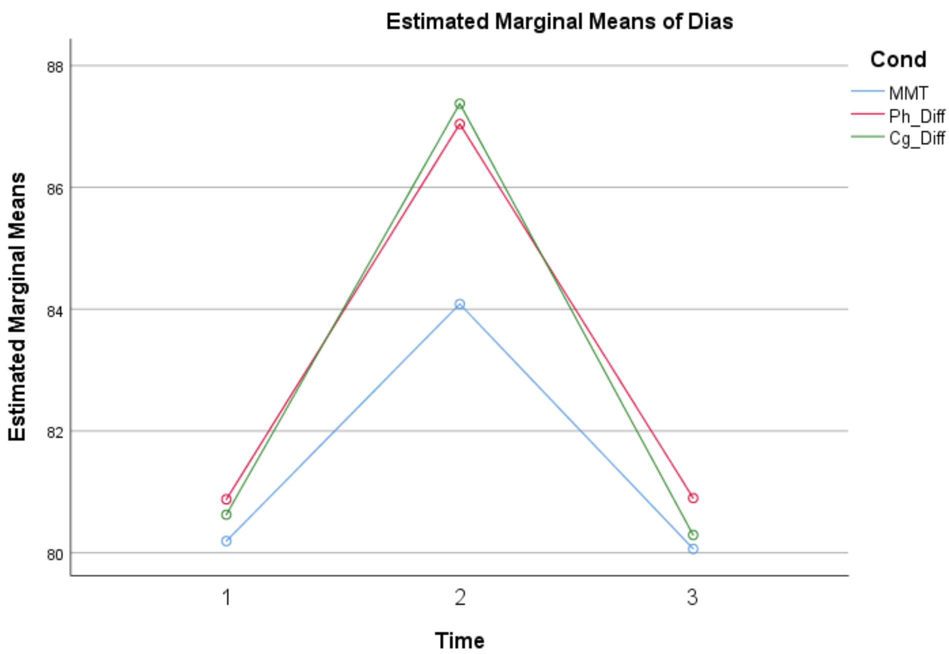
The interaction effect of difficult media multitasking conditions and the systolic blood pressure intervals were insignificant ($F(4,282) = 1.568$, $p = .183$, $\eta^2 = .022$). As it can be seen from Figure 4.12, the interaction plot of the means of the three systolic blood pressure measurement intervals clearly suggests that there is almost no difference in the pre-task and post-task systolic blood pressure measurements between the three conditions. Importantly, there was an increase in the systolic blood pressure of participants in both physically difficult and cognitively difficult media multitasking conditions as compared to non-difficult media multitasking conditions. The systolic blood pressure in the non-difficult media multitasking condition changed very less as compared to the systolic blood pressure measurement of the other two media multitasking conditions.

Figure 4.12: Study 2B Systolic Blood Pressure at different time points



The interaction effect of the difficult media conditions and the diastolic blood pressure intervals were insignificant ($F(4,282) = 1.152$, $p = .333$, $\eta^2 = .016$). In Figure 4.13, the interaction plot of the means of the three diastolic blood pressure measurement intervals indicates that there are no major changes in the diastolic blood pressure between the three conditions in the pre-task and post-task measurements. There was a much higher increase in the diastolic blood pressure in the physically difficult and cognitively difficult media multitasking conditions during the task as compared to non-difficult media multitasking conditions.

Figure 4.13: Study 2B Diastolic Blood Pressure at different time points



The physical and cognitive difficult media multitasking are similar in heart rate and blood pressure (systolic and diastolic) increase. After analysing the physiological differences (heart rate and blood pressure) between the three media multitasking conditions and within the predefined intervals of measurement, there was strong evidence that both physically and cognitively difficult media multitasking conditions have the same effect on the physiology of the human body. The use of a non-dominant hand and performing a high cognitive task before media multitasking was not stressful or dangerous and would not have lead to negative consequences if a person failed to perform the manipulation, therefore both the tasks did not excessively increase the heart rate or the blood pressure of the participants.

4.12.5 Comparison of differences in Brand memory

A one-way ANOVA was conducted to compare the scores of memory of the brands shown on TV and brand shown on the mobile with the football match among the three media multitasking conditions.

The Levene's test showed that the variance of the three conditions in their scores of memory of the TV brands was not statistically different (F(2, 141) = 1.47, p = .233), which fulfiled the assumption of homogeneity of variance. The results of the one way ANOVA present that difficulty has a significant effect on the memory of the brands shown on the TV on the three media multitasking conditions, (F(2, 141) = 8.36, p <.001). A Tukey post hoc test revealed that the memory of the brands shown on TV while media multitasking was less for the participants in the cognitively difficult media multitasking condition ($\bar{X}$ = .40, S.D.= .64) compared to the non-difficult media multitasking ($\bar{X}$ = .77, S.D.= .69, p <.05) and physically-difficult media multitasking ($\bar{X}$ = 94., S.D.= .65, p <.00). There was no statistically significant difference between the physically difficult condition and the non-difficult condition (p =.41).

The Levene's test also checked the variance in the scores of the three conditions for the brand shown on mobile and it was not statistically different among the conditions (F(2, 141) = 1.43, p = .242), fulfilling the homogeneity of variance assumption. The results of the one way ANOVA showed that difficulty also has a significant effect on the memory of the brand shown on the mobile across all three media multitasking conditions, (F(2, 141) = 10.931, p <.001). A Tukey post hoc test revealed that the memory of the brand shown on the mobile while media multitasking less for the participants in the cognitively-difficult media multitasking condition ($\bar{X}$ = .31, S.D.= .62) compared to the non-difficult media multitasking ($\bar{X}$ = .68, S.D.= .66, p <.05) and physically difficult media multitasking ($\bar{X}$ = 92., S.D.= .64, p <.00). There was no statistically significant difference between the physically-difficult condition and the non-difficult condition (p =.17). Table 4.17 presents the scores of brand memory of TV and brand memory of mobile. The next section presents the effect of physical difficulty on memory.

Table 4.17: Study 2B Dependent Variables Mean and Standard Deviation

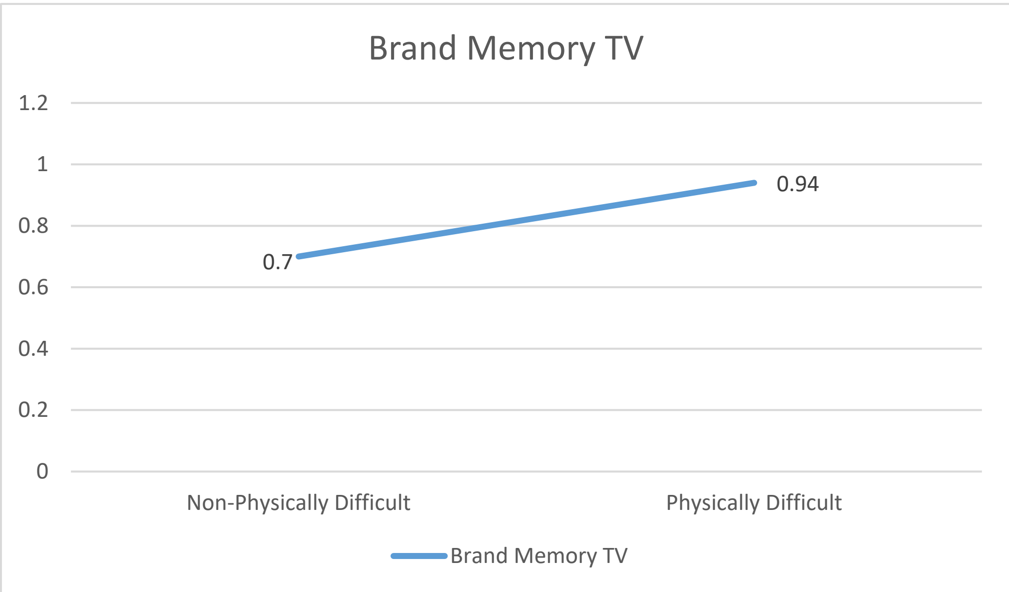
Variable	MMT		PDMT		CDMT	
	Mean	SD.	Mean	SD.	Mean	SD.
Brand Memory TV	.77	.69	.94	.65	.40	.64
Brand Memory Mobile	.68	.66	.92	.64	.31	.62

4.12.6 The Effect of Physical Difficulty on Brand Memory

To test the main effect of difficulty on TV brand memory, a simple regression analysis was done. Dummy coding was used to test the hypothesis for the two difficult media multitasking conditions (physically-difficult and cognitively-difficult). The dummies for the physically-difficult (physically-difficult = 1, otherwise =0) and cognitively-difficult (cognitively-difficult =1, otherwise = 0) and used non-difficult media multitasking condition as the reference condition. The simple regression analysis for the effect of physically-difficulty on the TV brand memory revealed that when people find the media multitasking physically difficult their memory of the brands shown on TV increases by β

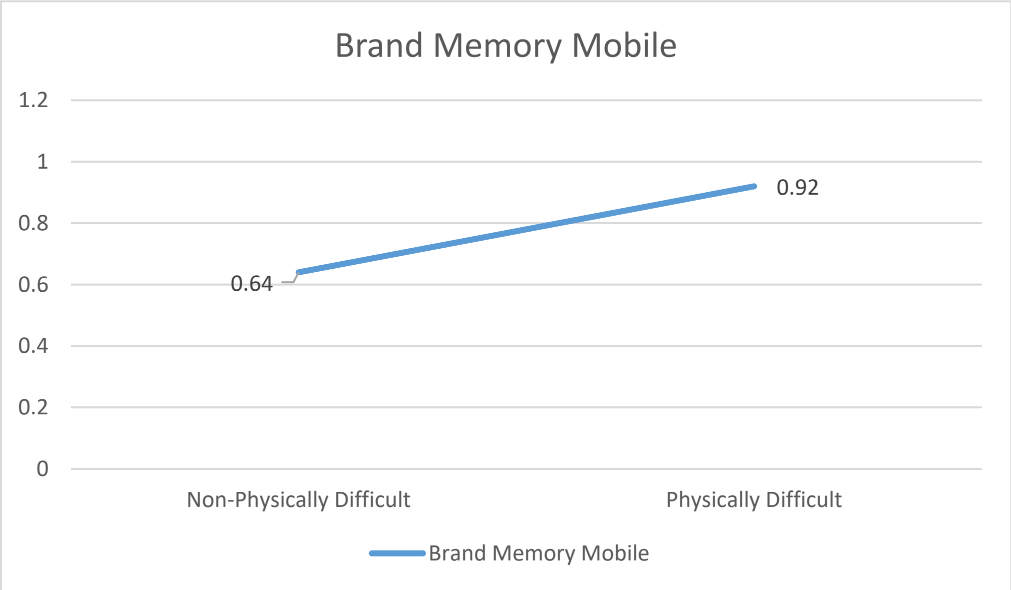
.244 units (t = 3.001, p <.01), as compared to when they do not find it physically difficult. Figure 4.14, presents the slope of the increase in TV brand memory from non-physically difficult conditions to physically difficult conditions. The R squared, a statistical measure of goodness of fit for the linear model is R^2 = 6%. It provides evidence that difficulty explains some proportion in the variation of the viewer's memory of brands shown on the TV.

Figure 4.14: Study 2B – Physically Difficulty vs Non-Physically Difficult Scores of TV Brand Memory



Simple regression analysis also tested the main effect of difficulty on the memory of the brand shown on mobile. The effect of physical difficulty (dummy variable) on the memory of the brand shown on the mobile while media multitasking revealed that their memory of the brand increased by β .294 units, when they perceived the media multitasking as physically difficult as compared to when they did not find the media multitasking physically difficult. Figure 4.15 shows that when the media multitasking changes to physically difficult from physically non-difficult (i.e., 1 unit of difficult difference), the viewers' memory of the brand shown on the mobile increases by .294 units. R^2 = 8.6%, stating that physical difficulty explains 8.6% of the variation of the viewer's memory of brands shown on the mobile. The above results, therefore, provide sufficient evidence to support hypotheses H8a and H8b.

Figure 4.15: Study 2B – Physically Difficulty vs Non-Physically Difficult Scores of Brand Memory Mobile



The effect of physical difficulty on memory has not been directly proven in the literature but Sanders (1983, 1998) proposed a cognitive energetic model which provides evidence of three mechanisms (arousal, activation and effort) that influence information processing. Media multitasking is a high workload and requires more effort to perform multiple tasks. Based on the cognitive energetic model suggested by Sanders, the underlying mechanism of effort influences the information processing while media multitasking.

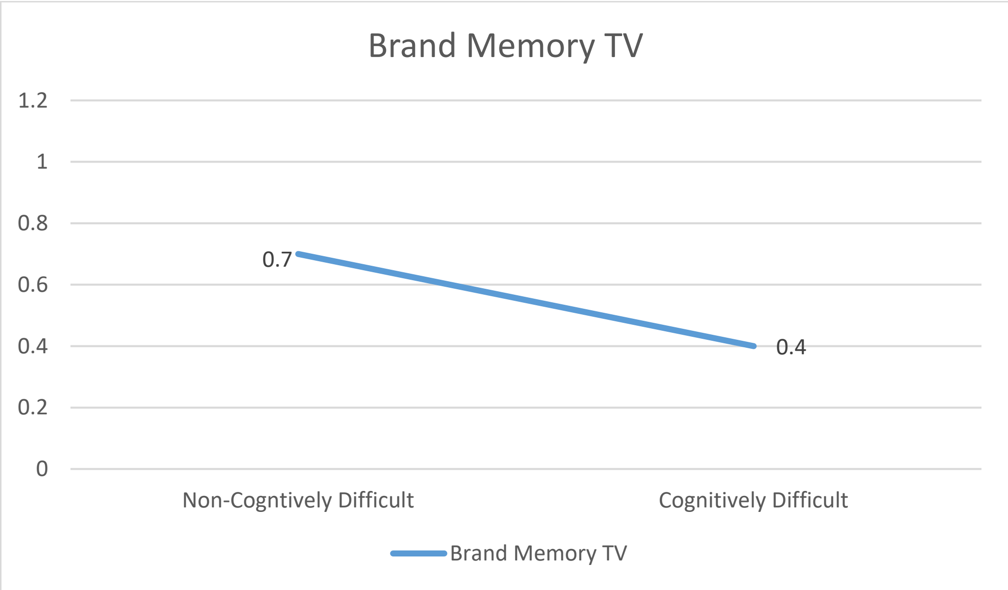
In medical research, Davranche et al. (2005) tested people's information processing on a choice reaction time tasks (CRT), (where participants have to provide different responses to two or more stimuli through rapid identification and differential responding based on the stimuli). The CRT is similar to media multitasking in terms of workload as they both involve processing information from multiple sources at the same time. Davranche et al. (2005) found empirical evidence that some form of physical effort improved sensory sensibilities during the CRT, which resulted in improved peripheral processing of their participants. In another research, peripheral processing has been proven beneficial in improving the recognition of advertisements while media multitasking (Duff and Sar, 2015). Peripheral processing is a direct expression of visual memory such as recognition of texts, colours, shapes and objects (Magnussen, 2009). In this research, physical difficulty positively influences the brand memory of the participants. The reason for the improved memory has not been explored in this study, but from the results, it can be elicited that physical difficulty might have increased sensory sensibility and peripheral processing which resulted in the positive brand memory of participants in the physically difficult condition.

4.12.7 The Effect of Cognitive Difficulty on Brand Memory

To test the main effect of cognitive difficulty on the memory of brands shown on the TV, a simple regression analysis (with cognitive-difficulty as a dummy variable) was conducted. It revealed that participants' memory of the brands shown on TV when they are involved in a cognitively difficult media multitasking reduces by .31 units (β .31, t =-3.87, p <.001), as compared to when they are involved in non-cognitively difficult media multitasking. Figure 4.16, presents the slope of TV brand memory when there is a unit of change from cognitively non-difficult condition to cognitively difficult condition. The

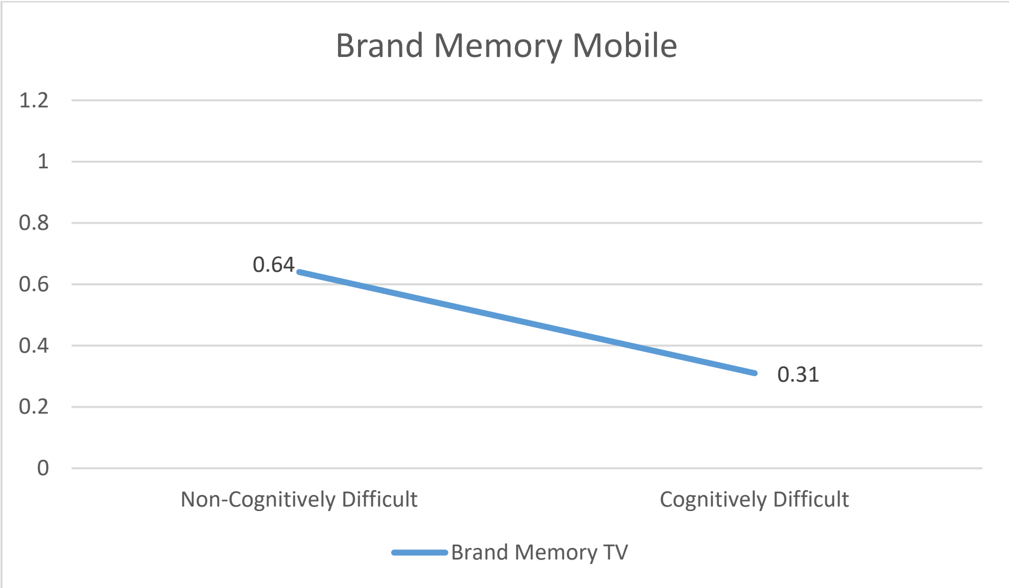
R square (R^2 = 9.6%) provides evidence that cognitive difficulty explains some proportion of the variation in the viewers' memory of brands shown on the TV.

Figure 4.16: Study 2B – Cognitively Difficulty vs Non-Cognitively Difficult Scores of TV Brand Memory



To test the main effect of cognitive difficulty on the memory of brands shown on the mobile, a simple regression analysis (with cognitive-difficulty as a dummy variable) was conducted. It revealed that participants' memory of the brands shown on the mobile when they were indulging in a cognitively difficult media multitasking reduces by β .33 (t = -4.27, p <.001) units, as compared to non-cognitively difficult media multitasking. Figure 4.17, shows that as people find media multitasking cognitively difficult in comparison to non-cognitively difficult (i.e., 1 unit of difficult difference), their memory of the brand shown on the mobile decreases by .33 units. The R^2 = 11.4%, provides evidence that cognitive difficulty explains some proportion in the variation of the viewer's memory of brands shown on the mobile. Thus, it can be concluded that hypotheses H9a and H9b can be accepted.

Figure 4.17: Study 2B – Cognitively Difficulty vs Non-Cognitively Difficult Scores of Brand Memory Mobile



In this study, cognitive difficulty negatively affects the memory of the sponsors. It is an addition to the growing literature of factors responsible for the poor memory of advertisements while media multitasking (Jeong and Hwang, 2016). The cognitive load leads to poor memory of brand placements even when people are watching TV without distractions (Gillespie et al., 2012). The results of this study confirm that brand memory deteriorates when there is excessive cognitive load while media multitasking. The participants' had a cognitive load more than other conditions while media multitasking in the cognitively difficult condition and this reduced their share of information processing resources required to process sponsored brands in their memory. The cognitive difficulty increases the load on the processing power, which is already running on limited mental resources during media multitasking. The processing power is left with fewer mental resources as the resources required to perform a difficult task are drawn from the same pool of mental resources required for information processing. These results are aligned with those of Wicken's multiple resource theory (1984) which states that the tasks that share the same resources will strain the information processing capability.

4.13 Summary

The study complements the theory of Wickens Multiple Resource Theory (1984) in the media multitasking context, wherein, the tasks that require resources from the same source have an adverse effect on the processing of information and tasks that require resources from different sources have a favourable effect on information processing. A real-life media multitasking scenario of watching a football match and texting during the match was simulated in a laboratory. Participants' watched the match on a TV and used a smartphone for texting during the match.

Task difficulty's effect on brand memory was explored by manipulating the type of difficulty. Physically difficult media multitasking was manipulated by asking participants to use a smartphone with their non-dominant hand, while cognitive difficulty was manipulated by depleting the mental workload capacity of participants by engaging them in a difficult task prior to media multitasking. The results provided evidence that the memory of advertisements would be greater when people are involved in a physically difficult media multitasking as compared to when it is cognitively difficult for them. The physical exertion of media multitasking does not impact upon the mental processing capability of advertising messages. The effect of physical and cognitive difficult on information processing are different, but their effect on the heart rate and blood pressure is similar. The results from the study 2B provide evidence to support hypotheses H8 and H9.

The results of this study align with the literature on the effect of physical efforts on information processing capability. Empirical data from neuroscience and psychology suggest that physical exertion does not have a direct effect on information processing but influences positively in indirect ways (Audiffren et al., 2008; Davranche et al., 2006; Dietrich and Sparling, 2004). The results also support the literature on the effect of cognitive difficulty on information processing (Lang, 2000; Jeong and Hwang, 2016). Thus, it is essential that multitasking should not be cognitively exerting for the people as it will weaken the information processing capability and eventually advertising effectiveness.

In line with the present study's results, the advertising message must not add to the cognitive difficulty of processing information during media multitasking. In fact, it should be made easier for people to process advertising messages during media multitasking. Research on advertising effectiveness has found that the processing ease of understanding the advertising message results in positive consumer behaviour (Leonhardt et al., 2015; Shapiro and Nielsen, 2012). This ease of processing has been referred to as processing fluency, a metacognitive experience of differential ease of processing (Leonhardt et al., 2015). In the next study, the role of processing fluency in the context of media multitasking will be explored to conceptualise the mechanism of advertising effective media multitasking.

CHAPTER FIVE STUDY 3: THE UNDERLYING MECHANISM OF SYNCHRONISED ADVERTISING AND ITS EFFECT ON BRAND MEMORY AND BRAND ATTITUDE

5.1 Overview

In Chapter 4, the results confirm that the degree to which people find multitasking difficult impacts upon the effectiveness of advertisements, as regards brand memory, delivered on one or both of the screens. Brand memory was worse when a cognitive limitation was placed on participants rather than a physical one. Whilst this finding is consistent with the multiple resource theory (Wickens, 1984), the study did not consider the relationship between the advertisements on both the screens and the effect of their relationship on the processing of the advertisements. However, this is potentially important as the relatedness of advertisements has been shown to impact marketing effectiveness in other contexts (Voorveld and Valkunberg, 2015).

The role of fit has been studied in the context of media multitasking in recent years (Angell et al. 2016; Segijn et al., 2017). Scholars have pointed to three different types of fit in their work (Segijn, 2017). These are broadly labelled as (i) task fit, (ii) screen content fit and (iii) advertisement fit. The first relates to the fit between the tasks of media multitasking and also has been termed as task relevance (Segijn, 2017). It is defined as "whether the tasks involved in media multitasking serve closely related goals (or a single overarching goal)" (Wang et al., 2015, p. 109). The task relevance captures the activity a person initiates as a secondary task and the extent to which this relates to their primary task. For instance, a participant is tweeting or texting on their mobile phone about a football match they are watching on their TV (Angell et al., 2016). In contrast, if the person is tweeting or texting about something other than football, it would not represent high task-relevance (or fit). The two tasks - watching football and texting about it - have a common goal, that is, the pursuit of football entertainment. The second type of fit (screen content fit) pertains to the congruence of an advertisement appearing on one of the types of media and the natural connection it has in that context – scholars discuss this as "the degree to which two stimuli match or fit together" (Garretson and Niedrich, 2004, p. 27). For example, a high level of screen fit would be considered if a kitchen appliance brand is displayed, promoted or advertised during or in the commercial breaks of The Great British Bake Off. It is worth noting that the degree of screen content fit is also germane to a media multitasking context. For example, the same kitchen appliance brand might also be advertised, and received, on a person's mobile device whilst she/he is watching The Great British Bake Off on TV.

The third type (advertisement fit) relates to a special form of fit where the advertisement itself (not the TV show, as in the context of screen content fit) is the same across different media. For example, while watching TV*,* the same advertisement would appear on two different devices, such as on the TV and on a mobile device. This is termed cross-media advertising.

In the modern era, a new form of cross-media advertising, known as synchronised advertising, has emerged that facilitates *'ad fit'* in real-time in a media multitasking environment. Synchronised advertising pertains to the delivery of advertisements on more than one device, made possible through data-driven marketing and technological advances. As such, marketers are able to control for a high level of 'ad fit' by employing this approach (Kantrowitz, 2014; Segijn et al., 2019). It is worth noting that this represents the cutting edge in modern-day advertising, although it is still developing as a methodology. For instance, while watching a football match sponsored by Heineken, a viewer also receives the same Heineken advertisement on her/his mobile device. Synchronised advertising is relatively new to both theory and practice, and until now there has been limited research into its effect. It is important to differentiate the synchronised advertising from cross-media advertising, although they share some common characteristics:

(i) Timing: In synchronised advertisements, it is essential to deliver the advertisements on multiple media simultaneously in real-time on both devices, but in cross-media advertisements, the real-time simultaneous delivery is not essential. The objective of cross-media advertisements is to have a combined greater effect by delivering advertisements on different media (Naik and Raman, 2003). However, synchronised advertisements, in addition to delivering advertisements on multiple media, also incorporate the importance of delivering them at the same time for a much more significant effect. Using the same Heineken example, if a viewer receives a Heineken advertisement on a mobile device before or after watching the football game sponsored by Heineken on the television, it is a cross-media advertisement, but when the mobile advertisement is received while watching the game, it is a synchronised advertisement.

(ii) Personalisation: The second and most important difference between synchronised and cross-media advertising is that of personalisation. Synchronised advertising is different from cross-media advertising in delivering advertisements based on people's current media usage. The advertisements on a mobile device will be delivered exclusively to people who are watching the content with the same advertisement on television, for example, the Heineken advertisement would be delivered only on the mobile devices of people who are watching the Heineken sponsored football match. The synchronised advertisements are delivered to people who are watching the football match on the primary device in real time; this is in contrast to other data-driven advertising strategies (online behavioural advertisements) which are based on an individual's past media usage, e.g. website visits and previous purchases.

Despite the aforementioned differences, it is argued that the ability of people to process synchronised advertisements does not vary significantly from their ability to process cross-media advertisements (Segijn and Voorveld, 2020). Whilst advertisements are delivered simultaneously in the context of synchronised advertising, they are not necessarily processed in the same way, since for some people, this process happens sequentially (Pilotta and Schultz, 2005). The impact of synchronised advertisements will be the same even if the advertisements are processed sequentially. One of the first research projects in synchronised advertising empirically proved that there was no difference in advertising outcomes when synchronised advertisements were delivered simultaneously or a few seconds (±45 seconds) apart from each other (Segijn and Voorveld, 2020). Table 5.1 illustrates the different types of advertisements while media multitasking.

Table 5.1: Example to Illustrate Types of Advertisements in Media Multitasking

TV Content	TV Ad	Mobile Content	Mobile Ad	Ad Placement in Real-Time MMT	Ad Type
Football	Heineken	Other	Heineken	Before/After	Cross Media
Football	Heineken	Other	Heineken	During	Synchronised Ads
Football	Heineken	Other	Other*	During	Online Behavioural Ad

In this example, a football match sponsored by Heineken is shown on television, while on their mobile devices (Tablets/Smartphones), people are delivered advertisements on their social media feed that are unrelated to football.

*Considering the Mobile Ad is data-driven and based on an individual's past purchases and website use and is unrelated to the content on the television.

After considering the differences and similarities between cross-media and synchronised advertising, there are lessons that can be learned about the latter from the former. For instance, earlier research looking at the effectiveness of cross-media campaigns suggests that recipients evaluate the brands with repeated exposures across media platforms more positively (Batra and Ray, 1986; Schmidt and Eisend, 2015; Voorveld and Valkenburg, 2015). However, the same research also suggests that the recipients are no more able to recall or recognise those brands in tests of memory. An explanation for this is that it is due to the way people store and retrieve information.

Research suggests that people store information in their memory in an organised manner, where all the related information is stored together, which facilitates both the adding of new information and the retrieving of old information. For instance, a person's memory structure for the sport of cricket may have information related to that person's favourite team, its players and important matches. Any new information regarding this sport will be stored in the cricket memory structure. This organised mechanism of storing information is known as *schema* (Vernon, 1955; Goldstein and Chance, 1980). Similarly, people create a brand schema where information regarding a particular brand is stored.

In a cross-media strategy, advertisements are repeated on multiple media, and with every repetition its ability to trigger a deeper level of cognitive processing declines as a consequence of its diminishing novelty and failure to generate intrigue in a person's schema (Voorveld and Valkenburg, 2015). When people receive an advertisement of the same brand with a variation, their corresponding schema is not only activated but leads to an enhanced ability to recall information pertaining to the brand. In one study, the effect of repetition of advertisements on memory was examined by comparing varied advertisements with the same advertisements (Unnava and Burnkrant, 1991). Subjects were exposed to the same or varied advertisements of a fictitious brand of shampoo in a print magazine. In the varied advertising condition, the context was different between the advertisements; in the first advertisement, an office scene was depicted where the boss notices the dandruff of her employee**;** in the second advertisement, a young man is put off by the dandruff of a girl. The results showed that keeping the number of exposures constant, the variation in advertisements resulted in an enhanced recall of the shampoo brand. The variation among advertisements should be large enough to have an impact on the schema, such as the context in the above-mentioned example. The mere repetition of advertisements without any variation in cross-media produces negative effects on memory. This has been empirically proven in the case of cross-media advertisements, where the advertisements of media campaigns with a higher fit (same colour, key visuals, slogan, etc.) resulted in negative brand recognition (Voorveld and Valkunberg, 2015).

Naturally, a dearth of activating brand schema weakens the retrieval routes of brand information and thus repeated cross-media advertisements perform poorly in a test of memory.

In contrast, the repetition of advertisements in cross-media has a positive effect on evaluative outcomes. The reason for this is the congruence between the repeated information and the brand schema, which does not invoke lower effort from the receiver to elaborate the information (Stangor and McMillan, 1992). The less effort required for processing the predictable and expected information of repeated advertisements elicits positive feelings, which spill over into more positive evaluations for the brand (Heckler and Childlers, 1992; Jagre et al., 2001). For example, in one study, a student sample was exposed to credit card and car rental advertisements across three media – print magazines, a website and email; the results showed people had a higher brand attitude for cross-media advertisements than for the advertisements seen only on a single media (Chatterjee, 2012). The repetition of advertisements across different media made the cognitive processing less of an effort with each repetition as it is congruent to the brand schema created with the first exposure. The advertisements with high fit also positively affect the brand evaluation in cross-media advertisements (Naik and Prasad, 2003, Assael, 2011; Voorveld and Valkenburg, 2015). For example, an advertisement showing a man entering a bar elicits positive evaluation when a beer brand is promoted in the advertisement as compared to detergent because beer is more congruent within the bar context than detergent. In summary, the less effort the advertisements take to process, the more positively they are evaluated.

It is important to reflect the effects of cross-media advertisements in the context of synchronised advertisements, as the latter is an advanced version of the former. There has been a paucity of research into synchronised advertisements as research has only focussed on the effect of brand attitude (Segijn and Voorveld, 2020). This study redresses the lack of earlier research by testing the effects of synchronised advertising on brand memory in addition to brand attitude. It is also the first study to examine the underlying mechanism of the effect of synchronised advertising on brand memory and brand attitude.

5.1.1. Underlying effects of Synced Advertising: Mediators and Moderators

It is proposed that the effect of synchronised advertisements on advertising outcomes is mediated by processing fluency. Processing fluency, which is the ease, or difficulty, with which information is processed (Shwarz, 2004); is critical in advertising processing as it positively affects decision making and judgement (Shen et al., 2009; Landwehr et al., 2011), persuasion (Lee and Aaker, 2004), brand evaluation (Rebber et al.,1998; Torelli and Ahluwalia, 2011), and recognition memory (Lanska et al., 2014). As previous research has shown, processing fluency has also been pivotal in cross-media effects, as previous research has shown that overlapping cues (e.g. same colours or spokespeople) received by consumers across different media are processed more fluently (Fransen et al., 2010; Voorveld and Valkunberg, 2015). This is due to the feelings of ease experienced by subjects (fluency) because of prior exposure to the same or related information (Shen and et al., 2009; Labroo and Lee, 2006). The positive valence of fluency translates into a positive attitude towards the subsequent exposures. The feeling of familiarity serves as the basis of processing fluency (Jacoby and Dallas, 1981; Johnston et al., 1985). For example, a person receives an advertisement for a car brand on their mobile device, and after few days, the same car brand is placed in the storyline of a TV show. The familiarity of the car brand through two exposures facilitates fluency and is thus better encoded by the viewer. The higher fluency would positively affect the attitude of the viewer towards the car brand. The variation of context in advertisements (sponsored mobile advertisement and product placement on TV) would also have a significant effect on the memory of the brand, as varied cross-media advertisements are better stored in the memory. The congruence of modality (both advertisements being visual) between the advertisements would also affect the memory positively through higher fluency (Fransen et al., 2010).

In their cross-media study, Fransen et al. (2010) demonstrated that congruence in communication modality (visual and visual) as compared to incongruence (visual and audio) had a positive effect on brand attitude and memory and is mediated by processing fluency. In the synchronised advertisement situation, the delivery of the advertisements on the two devices will be in real-time and is expected to elicit instant fluency and eventually result in positive brand attitudes and greater brand memory.

Exposure to a stimulus from two different sources, either together or in quick succession, are encoded together and are readily accessible in memory, and the increased accessibility enhances the ease with which it is processed (Dalmaijer et al., 2018; Reber et al., 1998; Lee and Labroo, 2004). When processing ease (fluency) increases, it leads to a favourable attitude towards the exposure (Lee and Labroo, 2004). The effect of processing fluency on brand memory is also expected to be positive as the synchronised advertisements are low in fit because they are different in modality and context.

The above mechanism of synchronised advertising effect is also proposed to be moderated by privacy concerns and source attractiveness. Research on persuasive message processing suggests non-substantive features of the message provide cues that affect message processing (Chaiken, 1980; Petty and Cacioppo, 1981). From the perspective of the Elaboration Likelihood Model, the level of involvement in a persuasive message decides the processing route (central/peripheral) of the message (Petty and Cacioppo, 1984). Privacy concerns in an online environment create a high involvement cue which directs a person to carefully elaborate the message by spending more cognitive energy (Bansal et al., 2015). This means that people with high privacy concerns get more involved in an online environment and follow a central processing path, whereas people with low privacy concerns are less involved and have a peripheral processing path. Past research findings have revealed that people with high privacy concerns have adopted analytical processing behaviour such as enhancing privacy settings and avoiding websites seeking personal information (Zarouali et al., 2017; Youn, 2009). Advertisements based on their past media usage create a feeling of privacy violation among some people (Bennet, 2011). In this study, participants receive synchronised advertising, i.e. receiving mobile advertisements based on content consumed on television, and it is expected that privacy concerns would moderate the processing fluency of the advertisement.

Another non-substantive feature of advertisements is the physical attractiveness of the people in them, which can transcend the involvement level of viewers towards the advertisements (Kahle and Homer, 1985). The physical attractiveness of the endorser (source of advertisement) of a product makes the advertisements more persuasive by moderating their impact (Shavitt et al., 1994; Kahle and Homer, 1985; Smith and Houwer, 2014). This is because when people experience high arousal, their ability to elaborate a message is reduced and they rely on less complex cues, such as attractiveness, to elaborate the message (Sanbonmatsu and Kardes, 1988). This dependence on less complex cues for elaboration directs people to follow the peripheral route of processing and ultimately leads to evaluating the message more favourably. Thus, the source attractiveness is expected to regulate the processing fluency in this study as the stimulus of this study includes products promoted by young people in their swimwear with attractive bodies, who are considered highly attractive (Cassidy et al., 2019). Table 5.2 sets out the hypothesis of the present study.

Table 5.2: Summary of Hypothesis and list of Variables of Study 3

	Independent Variable	Moderator Variable	Mediator Variable	Dependent Variable	Hypothesis	Model
H10a	Synced Ads			Brand Memory	People who receive synchronised advertising messages on their multiple devices during media multitasking will have a better memory of the advertised brands than the people who do not receive a synchronised advertising message.	Regression
H10b	Synced Ads			Brand Attitude	People who receive synchronised advertising messages on their multiple devices during media multitasking will have a better attitude towards the advertised brands than the people who do not receive a synchronised advertising message.	Regression
H11a	Synced Ads		Processing Fluency	Brand Memory	People who receive synchronised advertising messages on their multiple devices during media multitasking will have better processing fluency and will, therefore, have a better memory of the advertised brands than the people who do not receive synchronised advertising messages.	Mediation 1a
H11b	Synced Ads		Processing Fluency	Brand Attitude	People who receive synchronised advertising messages on their multiple devices during media multitasking will have better processing fluency and will, therefore, have a better attitude	Mediation 1b

					towards the advertised brands than the people who do not receive synchronised advertising messages.	
H12a	Synced Ads	Privacy Concern	Processing Fluency	Brand Memory	The mechanism via which the advertising synchronisation increases brand memory by increasing the processing fluency of the advertising messages is based on the individual's privacy concern. Specifically, the effect of advertising message synchronisation on the processing fluency is stronger for individuals with higher privacy concern.	Conditional Model 2a
H12b	Synced Ads	Privacy Concern	Processing Fluency	Brand Attitude	The mechanism via which the advertising synchronisation increases the brand attitude by increasing the processing fluency of the advertising messages is based on the individual's privacy concern. Specifically, the effect of advertising message synchronisation on the processing fluency is stronger for individuals with higher privacy concern.	Conditional Model 2b
H13a	Synced Ads	Source Attraction	Processing Fluency	Brand Memory	The mechanism via which the advertising synchronisation increases the brand memory by increasing the processing fluency of the advertising messages is based on the individual's perception of the attractiveness of the celebrity endorser. Specifically, the effect of advertising synchronisation on the processing fluency is weaker for individuals with higher perception of endorser's attractiveness.	Conditional Model 3a

H13b	Synced Ads	Source Attraction	Processing Fluency	Brand Attitude	The mechanism via which the advertising synchronisation increases the brand attitude by increasing the processing fluency of the advertising messages is based on the individual's perception of the attractiveness of the celebrity endorsers. Specifically, the effect of advertising message synchronisation on the processing fluency is weaker for individuals with higher perception of endorser's attractiveness.	Conditional Model 3b
H14a	Synced Ads	Privacy Concern + Source Attraction	Processing Fluency	Brand Memory	The mechanism via which the advertising synchronisation increases the brand memory by increasing the processing fluency of the advertising messages is contingent on the individual's privacy concern as well as the perception of the attractiveness of the endorsers.	Conditional Model 4a
H14b	Synced Ads	Privacy Concern + Source Attraction	Processing Fluency	Brand Attitude	The mechanism via which the advertising synchronisation increases the brand attitude by increasing the processing fluency of the advertising messages is contingent on the individual's privacy concern as well as the perception of the attractiveness of the endorsers.	Conditional Model 4b

5.2 Empirical Evidence: Study 3

The previous chapter focussed on cognitive difficulty and its detrimental effect on advertising outcomes. This chapter will try to uncover the importance of cognitive ease or processing fluency and its role in explaining the synced/synchronised advertising effect on advertising outcomes, as well as the moderation of privacy concerns and source attractiveness. Synced advertising and synchronised advertising will be used interchangeably from hereon.

The analysis of the present study is presented in three main sections. Section 5.6.4 will test the direct main effect of synchronised advertising on brand memory and brand attitude. Section 5.6.5 will explain the mediating role of processing fluency between the relationship of advertisement synchronisation and brand memory and brand attitude. Section 5.6.6 will build upon the findings of Section 5.6.5 and test the moderating effect of privacy concerns and source attraction on the relationship of advertisement synchronisation and processing fluency. The next section explains the choice of the stimulus and sample for this study.

5.2.1 Stimuli and Sample

An experiment setting that is comparable to a natural television viewing experience involving the use of a mobile phone while watching television was planned. The popularity of television shows among British viewers was a significant criterion in selecting the stimuli (Ofcom, 2018). As the objective was to make the television viewing experience as natural as possible for the target sample, it was essential to identify a television show which was watched most by the corresponding young population of the University campus (Robin, 2016).

The viewing of broadcast television has decreased significantly in the past decade (Ofcom, 2018). According to a recent Ofcom report, it has been due to the rise in viewership of digital media such as subscription video on demand like Netflix, Amazon Prime and Youtube. The average viewing time of broadcast television for a British viewer was over 4 hours per day in 2010, which has reduced to 3 hours 12 minutes in 2018 (OfCom, 2018). This decrease is much more profound in the younger audience (16-24 year-olds), who watched almost 1 hour 20 minutes of broadcast television in 2018 in comparison to their 2 hours 50 minutes of broadcast television in 2010.

However, ITV provided an exception to this trend with its reality television show *Love Island*, which had 50,000 viewers in 2015 when it started and increased its viewership to 4.7 million viewers by 2019 (BBC, 2019). *Love Island* is a British dating reality show which involves contestants from the public rather than celebrities. Its viewer-ship is strongly driven by young audiences, who make up the majority of the total viewers. Kyte’s (2019) data shows that 58% of the total viewers are 16-34 years of age. This made *Love Island* a natural choice of television stimulus for this study, which was conducted at a UK University campus where almost 80% of the students at the University campus are in the age group of 18-30 years. (HESA, 2019).

As one of the most popular shows among young viewers, it is highly attractive for the brands to indulge in partnerships or sponsorships that will directly appeal to young audiences (Smith, 2019). UberEats was last year's major sponsor of *Love Island,* which earned a significant boost in its popularity among the young audience by book-ending the broadcast (Kyte, 2019). The show is commercially lucrative for the broadcaster as well as sponsors who partner with the show. In addition to advertising, they benefit through product placement, brand licensing, podcast sponsors, in-store branding and exclusive product lines and merchandise (Sweney, 2019). Love Island was suited to the development of the stimulus as it is popular among the target sample and has regular product placements embedded in the show (ITV, 2020; Global Retail, 2019).

5.2.2 Pre-test:

5.2.2.1. Stimuli Development

People have a negative attitude towards different forms of advertising on television and tend to avoid advertising by changing the channel, skipping the advertisements (if watching a recorded show) or paying attention to another task rather than watching television (Bellman et al., 2012). The product placements are less negatively evaluated than other forms of advertisements (Brennan and Babin., 2004; de Gregorio & Sung, 2010). While media multitasking, product placements can sometimes even be beneficial to the advertisers by improving memory and strengthening brand perception. Love Island has regular product placements during each telecast which fits the stimulus requirements of this study (ITV, 2020; Global Retail, 2019).

Content analysis was carried out to identify prominent product placement in the Love Island episodes between 3rd June to 29th July 2019. In total, there were 58 episodes in the series resulting in almost 58 hours of analysis. The recording instrument of the placements was adapted from research by Ferraro and Avery (2000) and Nelson and Deshpande (2013), "the unit of analysis was the individual appearance of a brand (product or service) whether seen, mentioned or used" (Galican and Bourdeau, 2004, p 19).

The coding process of product placement was carried out following the same product placement content analysis studies (La Ferle and Edwards, 2006; Nelson and Deshpande, 2013). The visual and verbal brand occurrence of any logo or name was coded as a product placement without any distinction between them (Nelson and Deshpande, 2013).

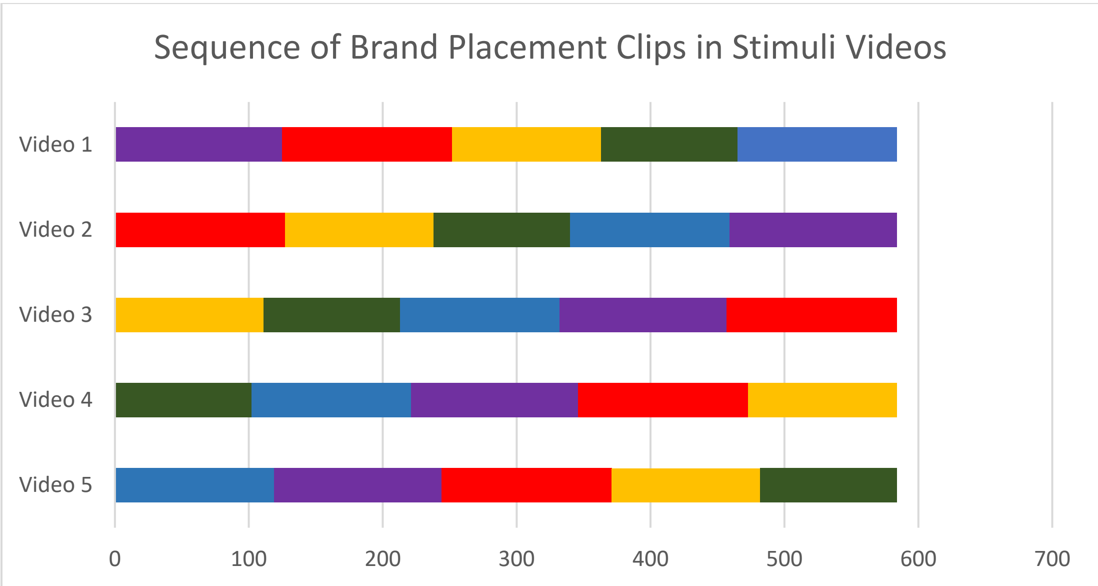
Product visibility in several frames in quick succession without a change in the scene was coded as single product placement. The duration of product visibility in several frames in the same scene was totalled to form a single product placement. The product placements of more than 15 seconds were selected for better exposure and saliency (La Ferla and Edwards, 2006)

The results from the content analysis provided five brands with more than 15 seconds of product placement in the show. There were other brands with prominent visibility, but they were all less than 15 seconds in total duration of visibility. Fifteen seconds deems an appropriate cut-off as it ensures adequate exposure possibility. Stimuli videos were generated from the five scene clips of the product placements by merging them one after the other. Each scene clip involved a different brand in the placement and was of a different product category.

Table 5.3: Brand Placement Details

Colour Code	Brand Advertisement	Product Category	Visibility of Brand (Seconds)	Duration of placement (seconds)
	Range Rover	Car/Automobile	60	2:05
Interval				0:02
	Ray-Ban	Sunglasses	64	2:07
Interval				0:02
	Rewired	Cap/Clothing	73	1:51
Interval				0:02
	Gelooteli	Ice-cream	74	1:42
Interval				0:02
	The Sun	Media-Publication	58	1:59

Figure 5.1: Stimulus Video Sequence: Colour coded*



**Kindly refer to the Table 5.3 for the key to colour code of the advertisements*

Five different stimuli videos were generated by putting the five scene-clips of product placements together in a different order to control the recency effect of the brands appearing last or first in the stimuli video (Hastie and Park; 1986; Biswas et al., 2014). Each stimuli video included all five product placement scene-clips separated by a two-second interval showing the *Love Island* logo. The order of each scene-clip differed in each video. This allowed each brand to be first, second, third, fourth and last in each video. The details and sequence of each product placement scene-clip in different stimuli videos are presented in Figure 5.1 and Figure 5.2 presents the screenshots from the scene clips featuring the brands in the product placement.

Figure 5.2: Snapshots of Visible Brand Placements

5.2.2.2 Participants and Characteristics

A pre-test was conducted at a public university in London, the United Kingdom, to test the brand attitude and brand saliency towards different brands placed during *Love Island*. (N=20, x̄ =21.3, SDage = 3.02, Male=50%). The participants were recruited through an invitation poster pinned on the notice boards of the University library, cafes and refractory. The participants were given a £5 Costa Coffee gift card in exchange for their time to watch a video and complete an online questionnaire. The main objective of the pre-test was to select the brands with a neutral attitude and which are easy to spot in the show (Segijn et al., 2017).

There were three criteria to select interested people to participate in the study. First, they should not have seen any episode of the *Love Island* season 5 to avoid familiarity with the brand placement. Second, they should be more than 18 years of age; and third, they should have a standard or corrected level of vision in order to view the TV screen without any difficulty. When a person fulfilled all three criteria, he/she was selected as a participant. The pre-test started by randomly allocating the participants to one of the five video stimulus conditions. The participants were asked to throw dice. On getting a number between one to five, they were allotted the respective first, second, third, fourth or the fifth video condition. On getting a six, they were asked to throw the dice again until they did not get a six.

5.2.2.3. Method and Design

After being allotted the stimulus condition, participants were invited to a room with a television and a comfortable armchair. The room was set up to simulate a comfortable living room experience for the participants. Next, the participants were asked to watch the stimulus video with their complete attention on the television screen. After watching the video, the participants were asked to complete an online survey on a laptop provided by the researcher. The survey included questions on programme liking, programme involvement, brand memory, brand attitude and finally, some demographic questions.

5.2.2.4 Measures

Programme Liking: The participants were asked to report their liking for *Love Island* using a four-items seven-point scale (1 = Strongly Disagree, 7 = Strongly Agree) inspired by Cowley and Barron (2008) which was initially adapted from Murry et al., (1992). The items were “I like watching Love Island"; “If I know Love Island is going to be on television, I would look forward to watching it"; "I like watching Love Island more than I do most other programmes.

Programme Involvement: The participants' involvement in the programme was measured using four items on a seven-point scale (1 = Strongly Disagree, 7 = Strongly Agree) as used by Segijn et al. (2017) and inspired by Bryant and Comisky (1978); Moorman et al., (2007); Norris and Colman, 1993). The items were "I found the video clip fascinating"; "I found the video-clip exciting"; "I found the video-clip interesting" and "I watched the video-clip attentively".

Brand Memory: Brand memory was calculated using a total of five memory questions. The first question asked them to list all the products they remembered being promoted in the video clip. Second, they were asked to list all the brands they remembered being promoted in the video clip. Third, they were asked to write the name of the brands in the specific product categories. Fourth, they were shown a list of logos of the brands and were asked to select the brands they remember from the video clip. Finally, they were shown a screen-shot of the clips of brand placement and were asked if they had seen any of them in the video (Segijn et al., 2017).

Brand Attitude: The brand attitude for each of the five brands was measured using three items on a seven-point semantic differential scale used by Chang and Thornson (2004) and which was initially adapted from Crites et al. (1994). The participants marked the brand attitude for each brand on items - Unlike/Like, Unappealing/Appealing, Bad/Good.

Control Variables: Participants reported their age, gender and education qualification.

5.2.2.5 Measurement Checks

All of the measures were tested for their appropriateness in measuring the relevant concepts. Cronbach's alpha was used to indicate the reliability of each measure as it is a function of the number of the items, the average covariance between item-pairs, and the variance of the total score (Pallant, 2013). Table 5.4 reports the reliability of all the measures with $\alpha > .8$, which indicates that all the measures are internally consistent and fit for use.

Table 5.4: Pre-test Reliability of Measures

Variable	Mean (SD)	Cronbach's Alpha	inter-item correlations
Programme Liking	3.45 (1.99)	.916	.681 - .917
Programme Involvement	4.27 (1.62)	.896	.439 - .899
Brand Attitude			
Range Rover	4.35 (1.14)	.947	.823 - .894
Ray-Ban	5.05 1.37)	.931	.744 - .893
Gelloteli	3.61 (1.60)	.824	.467 - .863
Rewired	3.95 (1.06)	.887	.636 - .848
The Sun	2.81 (1.36)	.825	.420 - .750

Five stimulus videos were created, and the participants were randomly allotted to a stimulus video to control for the effect of primacy or recency in their memory of the brands. A one-way ANOVA was conducted to check for differences in the memory of each brand in the five videos. The results show that the recency and primacy effects were controlled. There was statistically no difference in the memory of each brand in different video conditions; Range Rover (*p* = .929), Ray-Ban (*p* = .708), Gelotelli (*p* = .650), Rewired (*p* = .140) and The Sun (*p* = .736).

Similarly, the difference in the brand attitude between the five conditions was also tested using a one-way ANOVA. The results show that there is statistically no difference in the attitude towards the brands in different video conditions; Range Rover (*p* = .733), Ray-Ban (*p* = .308), Gelotelli (*p* = .369), Rewired (*p* = .486) and The Sun (*p* = .903). Thus, the primacy and recency effects were controlled as there was no statistical difference in the brand memory or brand attitude of the brands between different stimulus videos.

5.2.2.6 Results

The objective of the study was to identify brands that are noticed by the participants and for which they had a neutral attitude. Brands with a high positive or negative attitude are more accessible to memory; thus a neutral attitude brand does not have an advantage of being remembered more than others (Alter and Kamins, 1995; Kardes et al., 1993). Table 5.5 presents the brand memory and brand attitude for each brand.

Table 5.5: Brand Memory and Brand Attitude Scores in Pre-test

Variable	Brand Memory	Brand Attitude
Range Rover	1.850 (1.136)	4.350 (1.146)
Ray-Ban	1.750 (1.208)	5.050 (1.377)
Gelotelli	1.650 (.812)	3.616 (1.601)
Rewired	1.800 (1.321	3.950 (1.061)
The Sun	1.600 (.598)	2.816 (1.365)

Among the five brands, *Range Rover* had the highest brand memory and *The Sun* had the lowest brand memory. Although there is not a significant difference among the brands in their brand memory, *Range Rover* and *Rewired* had the highest brand memory with respective scores of 1.85 and 1.80. Participants had the most favourable brand attitude to *Ray-Ban*, whereas, the tabloid newspaper brand *The Sun* had the least favourable brand attitude. *Gelotelli*, *Rewired* and *Range Rover* scored closer to the median score of four on a scale of seven in brand attitude. A score of four on a scale of one to seven is a neutral score, as more than four is considered a positive score and less than four a negative score. Considering the two-fold criteria of selecting the brand with higher brand memory and neutral brand attitude, *Range Rover* and *Rewired* were selected. Even with a near-neutral score of brand attitude for *Gelotelli*, it was not selected as it was relatively less salient as compared to other brands.

Two brands were selected to be part of the final stimuli, as normally Love Island features multiple product placements in one telecast (Rogers, 2019). There are multiple brands promoting their product on the same platform, such as multiple products placed in one movie, multiple brands sponsoring one sporting event and multiple advertisements on the prime time show (Lee and Faber, 2007; Nicholls et al., 1994; Kent, 1993). Thus, it is suitable to have two brand placements in the stimulus video. *Range Rover* and *Rewired* were selected as they were the only ones with both high saliency and neutral attitude.

5.2.2.7 Summary

The pre-test was successful in identifying the appropriate brands as stimulus and the appropriateness of the university sample in this study. A stimulus video was created for the third study using the two salient and neutral attitude brands (*Range Rover* and *Rewired*). In study 3, the advertising synchronisation effect was tested while media multitasking. The sample for the study was also university students but in a different city. The details of the third study are discussed in the following section.

5.3 Study 3: Main Experiment

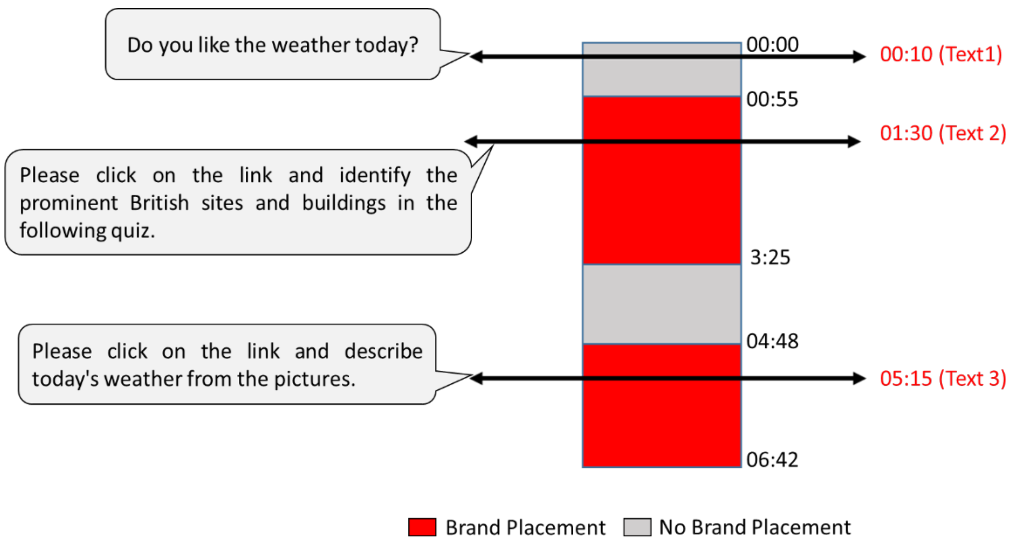
Study 3 aims to provide a mechanism that explains the advertising synchronisation effect during media multitasking on brand attitude and memory of the brands and helps marketers and advertisers to position their advertisements for maximum effect. The experiment consists of a single factor, between-subjects design with three media conditions - two media multitasking conditions and one control condition. A three-step analysis was followed in order to test the above-mentioned mechanism. In the first step, the role of processing fluency as the mediator of the relationship between advertisement synchronisation and brand memory (H11a) and brand attitude was tested (H11b). In the second step, the individual role of privacy concerns (H12a and H12b) and source attractiveness (H13a and H13b) in the mediation model of advertisement synchronisation was tested. Finally, step 3 tests the combined moderation of privacy concerns and source attractiveness on the mediation of processing fluency in the effect of advertisement synchronisation on brand memory (H14a) and brand attitude (H14b).

5.3.1 Stimuli Development

After the pre-test a new stimulus video was developed using the scene clips of the *Range Rover* and *Rewired* brand placements. The duration of the new video was of 6 minutes and 45 seconds and it was made to look natural as it was shown on television rather than a compilation of clips. The video was made using the Microsoft Video Editor Application for Windows 10. The placement of *Range Rover* was more embedded in the storyline of the show with a continuous scene of 2 minutes 30 seconds which included 60 seconds visibility of the brand. Participants were carried to the *Love Island* villa on a *Range Rover* convertible. Similarly, *Rewired* was also embedded in the storyline where every male participant was wearing a *Rewired* cap for more a particular session. The placement of *Rewired* was also edited by cutting down 10 seconds of the visibility to 63 seconds to make the visibility duration of both of the brands equal. The effect of both the placed brands on cognitive and affective outcomes was not expected to differ as they were placed with a similar level of embedding in the storyline. The exposure of both brands was purposely made equal in order to control for the advertising evaluation based on the duration of exposure (Elsen et al., 2016). The total time of the scene clip of *Rewired* was of 1 minute 54 seconds with 63 seconds of brand visibility. Figure 5.3 presents the timeline of the video.

The stimulus video started with the introduction of the show for the first 55 seconds. The placement of the Range Rover followed the introduction. The placement of *Range Rover* took place during the introduction of the participants in the first episode. It was better suited to be included first in the stimuli video than *Rewired,* which was placed during the middle of the season. The results from the pre-test revealed that there was no effect from the sequence of placement on the brand memory and brand attitude. The placement of the Range Rover started from the 56th second and continued until 2 minutes and 25 seconds. The next part included the interaction of the host with the participants without any brand placements. The final part included the placement of Rewired, which started at 4 minutes and 48 seconds and ended at 6 minutes and 42 seconds. Three text messages were sent during the screening of the video. The first text message was sent without a mobile advertisement at 10 seconds from the start of the video. The second text was embedded with a mobile advertisement and was sent during the placement of the Range Rover at 1 minute and 30 seconds. The final text was sent during the placement of Rewired at 5 minutes 15 seconds and also included a mobile advertisement. Figure 5.3 presents the timeline of the video and the text messages.

Figure 5.3: Timeline of Text Messages during Media Multitasking



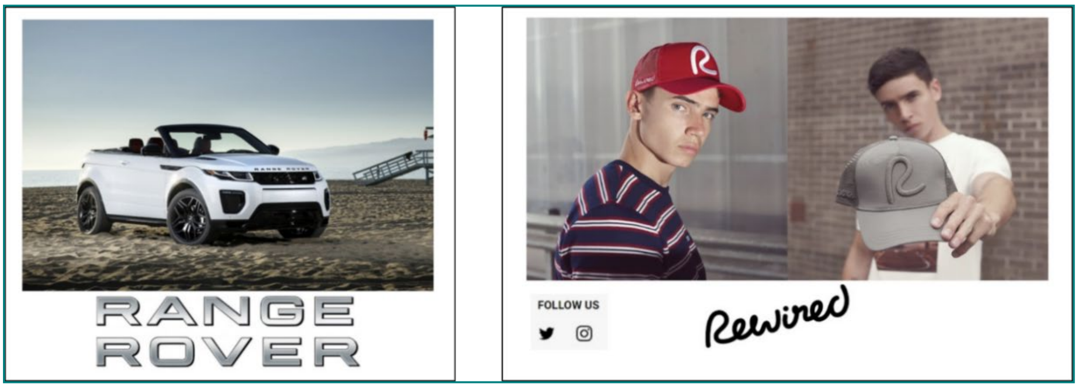
The participants were provided with a smartphone (iPhone SE) to use to read and write text messages while watching the show on television. The researcher at pre-defined time points sent the participants three pre-scripted text messages. The text messages were unrelated to the television show in order to avoid task-related bias as it results in improved memory while media multitasking (Angell et al. 2016, Segijn et al., 2017). The text messages were pre-tested through individual assessments of relatedness by three doctoral supervisors and three doctoral students. The assessors unanimously perceived the text messages to be unrelated to the television show and were thus included as stimuli. The same text messages were sent to the participants in all the conditions.

The advertisement synchronisation was manipulated by sending text messages with the mobile advertisements of the same brand that was visible on the television. The advertisements were visible at the same time as the brands were also visible on the television screen as product placement in order to manipulate the synchronisation of the advertisement. The mobile advertisements were embedded with social media interactive quizzes. Interactive quizzes are a source of momentary entertainment on social media and are extremely popular among people of all age groups (Haynam, 2015; Grandoni, 2014). The mobile advertisements of Range Rover and Rewired were used in the synchronised advertisement condition as they were placed in the television show. The mobile advertisements of Gazprom and FedEx were used to manipulate the non-synchronisation of advertisements as they were not placed in the television show. Gazprom, an energy corporation and FedEx, a delivery services company, were selected as they were unrelated to the television show. Gazprom and FedEx were pre-tested for their unrelatedness by three doctoral supervisors and three doctoral students of marketing. The objective was to select two real brands which were unrelated to the television show. The advertisements of the brands were embedded at the start of the quiz to simulate the real-life experience of using social media and manipulating the advertising synchronisation.

The synchronised advertisement images were downloaded from the brands' official websites. Gazprom and FedEx advertising images were also taken from their websites. Gazprom was used in place of Range Rover, and FedEx was used in place of Rewired in the non-synchronised condition.

Figure 5.4: The Mobile Ads of Non-Synchronised and Synchronised Conditions.

Synchronised Ads

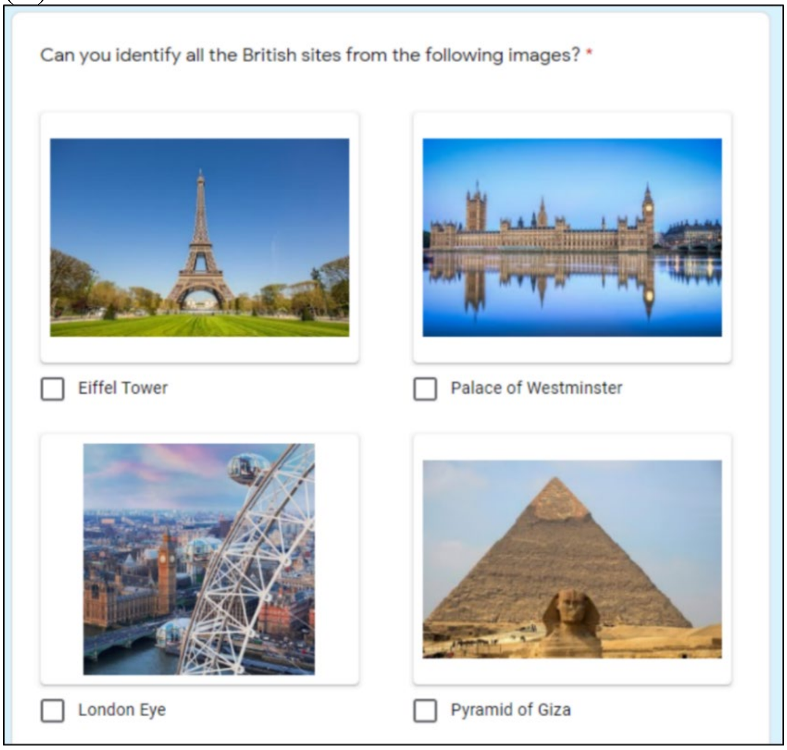


Non-synchronised Ads

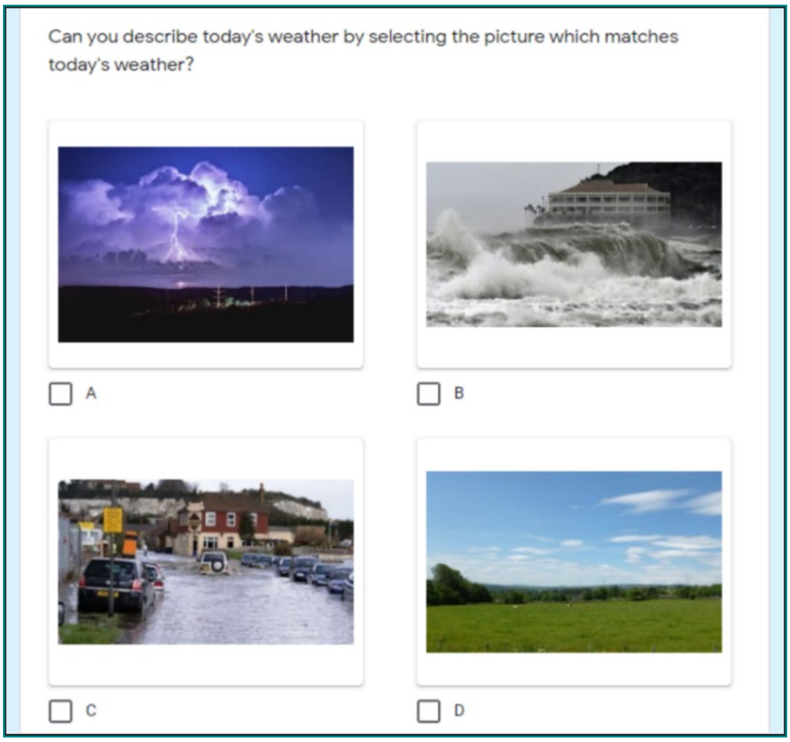
Two interactive quizzes were specifically designed for this study to simulate real-life social media experience. The interactive quiz was made on Google Forms. The first page had the image of the advertisements which they could skip by pressing the next button. The next button directed them to the quiz. The first quiz asked participants to identify famous British tourist attractions from a pool of eight images. The participants were required to click on the images they thought were in Great Britain. After clicking on the images, they were redirected to the messaging application. The second quiz was focused on the weather. Participants were required to click on an image that best described the weather of the day. Figure 5.5 presents the snapshots of the two quizzes.

Figure 5.5: Snapshot of Interactive Quiz. (A) Identify British tourist attractions; (B) Describe today's weather from the pictures

(A)



(B)



5.3.2 Procedure

The objective of the study was to see the effect of synchronised advertising messages on brand memory and brand attitude, as well as the underlying mechanism of this effect. The participants in the study were provided with a pseudo-objective of the study in order to eliminate memory bias - prior knowledge of memory test results in an unbiased estimate of the memory of the participants. A similar process disassociation procedure used in Study 1 and 2 was used by revealing an incorrect purpose of the study (Jacoby, 1991; Shapiro and Krishana, 2001). The participants were told that the objective of the study was to explore the behaviour of United Kingdom television viewers and their motivation to watch reality television. The real purpose of the study was revealed to the participants after the experiment.

Several A4 size sheet posters were put up around the campus of the University of Plymouth, which is the research setting for this study. The posters were put up in the library, cafes and students union with the pseudo-objective of the study to invite interest in participation. A £5 gift card from Costa Coffee, a leading coffee house chain, was promised as an incentive to participate. The participants had to meet three requirements for participation in the study. First, they should not have seen Love Island season 5; second, they should have a normal or corrected vision to watch television and; third, they should not have physical problems in operating a smartphone for texting. The participants who fulfilled the minimum requirements were part of the final sample of the experiment. The experiment process took approximately 15 minutes and consisted of four stages (1) Introduction, (2) Task, (3) Questionnaire and (4) Debriefing.

1. Introduction

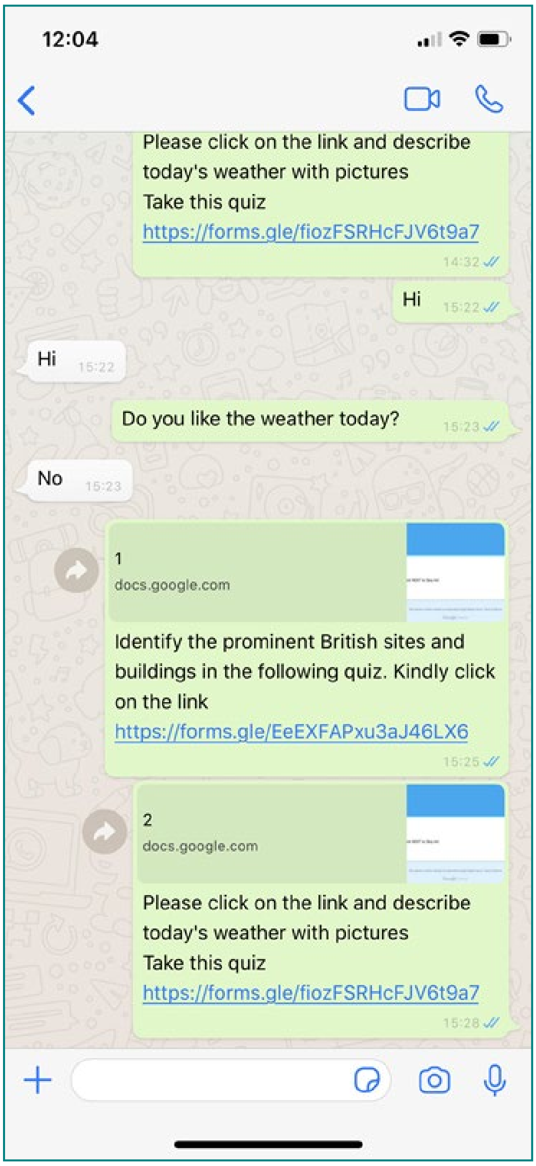
   Participants were first thanked for their time in participating in the experiment and then asked to sit on a comfortable armchair. The experiment room was set up to replicate a living room with a comfortable armchair and a television. The participants were provided with informed consent forms to sign in order to participate in the pseudo study. After this, they were randomly allocated to one of the three experimental conditions. Participants were allocated either one of the two media multitasking conditions (synchronised and non-synchronised) or one control condition with single-tasking. After the allocation, they were given specific instructions based on their experimental conditions.

In the single-tasking (control condition), participants were asked to watch the television with complete attention and without undertaking any other task. In the media multitasking conditions (synchronised and non-synchronised), they were asked to watch the television with complete attention and to also use a smartphone while watching the television. The participants were provided with a smartphone (iPhone SE) to receive and send text messages with the researcher while watching the television. They were asked to keep the mobile in their hands throughout the experiment. The mobile phone was without any screen lock for easy access by the participants. They were asked to reply to all the text messages they received on the WhatsApp application on the mobile and click on the links sent to them. A text message ('Hi') was sent to the participants as part of the instructions. They were asked to reply immediately by texting '*Hi'* to familiarise them with operating the mobile. After the instructions, the participants proceeded to their task stage.

2. Task

The participants in the single-tasking condition watched the stimulus video with placements on the television without any other task, whereas the participants in the media multitasking watched the television and undertook another task of using the mobile phone. The participants in the media multitasking condition received three text messages on their mobile phones, and they were asked to reply to the text messages or click on the links provided to them through texts messages. The details of the messages and their timing are presented in Figure 5.3, and a screenshot of the text messages is shown in Figure 5.6.

Figure 5.6: Screenshot of the text messages



The messages were the same for participants in both the media multitasking conditions except for the mobile advertisements in the second and third text messages. Links for the interactive quiz were sent in the second and third text messages which included advertisements. In the synchronised advertising condition, the participants received the advertisements of the same brands that were shown on the television, while in the non-synchronised condition, the mobile advertisements were different from the brands seen on the television. The participants proceeded to the questionnaire stage after undertaking the single/multiple tasks as per the condition.

3. Questionnaire

After watching the video, participants in the media multitasking condition were asked to hand the mobile phone back to the researcher. Participants in all three conditions were provided with laptops to complete an online questionnaire on Qualtrics, an online survey tool. All the questions were administered on a 7-point-Likert-type scales (1= 'strongly disagree' and 7=' strongly agree') or 7 points semantic differential scale (1= 'bad' and 7=' good'). The order of the questions was based on the logical structure suggested by Malhotra (2006). The questions were ordered in order to minimise carryover and contamination effects (Chang and Thorson, 2004). The memory questions were asked before the evaluation of the brands on other different scales.

The first set of questions were related to the stimuli- *Love Island* and the participants liking and involvement towards *Love Island*. In the second part, the participants answered the questions relevant to the dependent variables- brand memory, brand familiarity and brand attitude. In the third part, questions on processing fluency, the need for structure, and privacy concerns were asked. In the fourth part, participants gave their responses on product involvement, their attitude towards brand placements and their perception of the attractiveness of *Love Island's* participants. Finally, demographic questions like age, gender and education were asked. Participants were debriefed after completing the online survey.

4. Debriefing

   The laptop was collected from the participants after they had completed the questionnaire. Participants were told the real purpose of the study and the reason for using the pseudo-objective of the study. After debriefing, the participants were thanked for their participation and given a £5 gift card from Costa Coffee.

5.3.3 Participants and their Characteristics

The sample was comprised of 126 students from the University of Plymouth. The university sample is appropriate for the study as it is a comparatively younger sample and represents the majority of the viewers of the television show (Kyte, 2019; HESA, 2019). The sample of university students is relatively homogenous in terms of cognitive ability (memory), media habits (media multitasking) and attitudinal responses (Peterson, 2001), allowing the findings of the study to be dependent on the experimental manipulation and the participants' individual differences of fluency, privacy concerns, and attractiveness of the stimulus.

5.4 Measures and Scales

Independent Variable

- Advertising Synchronisation (non-synchronisation of the advertising messages vs synchronisation of the advertising messages while media multitasking): The participants were randomly assigned to one of the three conditions - single-tasking condition or synchronised advertising condition or non-synchronised advertising condition.

Manipulation Check

- Chat and advertising synchronisation: The participants indicated on two questions on a seven-point Likert-type scale (where 1= 'not at all related' and 7 = 'Strongly related') the extent to which they considered the chat messages and advertisements appearing on their mobile related to the stimuli (Segijn et al., 2017). In the first question, they reported their perception of relatedness of the chat messages on their mobiles with the television show they were watching. In the second question, they reported the level of relatedness between mobile advertisements and the brand placements shown on the television show.

Dependent Variable

- Brand Memory: The brand memory was measured using the same items as in the pre-test. The brand memory was calculated by the total score of correct answers on three different memory questions (Segijn et al., 2017). In the first question, the participants were asked a free-recall question to report the products and brands that were shown during the video (e.g. you may have noticed that contestants on the show were sometimes wearing, using or were close to a specific product or brand. Try and remember what you saw and then state the product and associated brand name in the box for each). In the second question, the participants were provided with an aided-recall question. They were asked to recall the brands in the video for each of the product categories (e.g. Can you recall the brand of a Car from the video-clip, Can you recall the brand of a Cap/Hat from the video clip?). In the third question, the participants were provided with eight pictures of the brand logo/names, four pictures of the car brand logo/names and four pictures of the cap/hat brand logo/names. They were asked to select the brand logos/names they recognised from the video clips. For all the above brand memory questions, each right answer for the product and brand name, the score of 1 was given, whereas for wrong or no answer, a score of 0 was given. A maximum score of 8 was possible for all the participants.

- Brand Attitude: The brand attitude was measured using the scale used in the pre-test. It measured the attitude by taking an average of the scores of three items on a 7-point semantic differential scale for each of the target brands. The scale was adapted from the original 7-point differential scale used by Crites et al. (1994) and Chang and Thornson (2004). The participants were asked to rate the *Range Rover* and *Rewired* brand on the following items, *Dislike/Like, Unappealing/Appealing and Bad/Good*.

Mediator

- Processing Fluency: The processing fluency was measured using a four-item semantic differential scale adapted from (Labroo & Lee, 2006; Lee & Aaker 2004) and (Dragojevic & Giles, 2016). The participants were asked to rate their processing of brand information in the television show on a four-item, seven-point scale (1= 'difficult to understand, not at all eye-catching, not at all clear, difficult to comprehend; 7= 'easy to understand, eye-catching, clear, easy to comprehend).

Moderators

- Privacy Concern: The present study adopts its items from the scale used by Baek & Morimoto (2012) and Smit et al. (2014) to measure privacy concerns. The three-item scale was measured on a seven-point Likert scale (1= 'strongly disagree' and 7=' strongly agree') with the statements such as, 'I believe my online personal data have been misused too often', 'I am concerned about the potential misuse of my personal data, 'I feel uncomfortable when data is shared without permission'.

- Source Attractiveness: The research participants perceived the attractiveness of the television show contestants on a three-items semantic differential scale, such as *Highly Unattractive/Highly Attractive, Ugly/Beautiful* and *Not at all Sexy/Sexy.* These items were taken from the scale used by Ohanian (1990) to measure the physical attractiveness of the source of the advertising message in terms of physical beauty, chic-ness and sexiness. The participants reported the attractiveness of contestants shown during the placement of each brand on the television. The final score of source attractiveness was averaged from the score of the attractiveness of both of the brands.

Control Variables

- Programme Liking: The liking for the television show *Love Island* was measured using a three-item 7-point Likert scale, using items, 'I like watching Love Island'; If I know Love Island is going to be on television I would look forward to watching it'; 'I like watching Love Island more than I do most other programmes'. Cowley and Barren used the same scale, (2008) adapted from Murry et al. (1992).

- Programme Involvement: The participants' involvement in the programme is measured by a three-item Likert scale used by Segijn et al. (2017). The items of the scale are, 'I found the video clip fascinating'; 'I found the video clip exciting'; 'I found the video clip interesting'; 'I watched video clip attentively'. The scale is adapted from Bryant and Comisky (1978) and Moorman et al. (2007).

- Product Involvement: The involvement towards certain products could differentially impact the attention and processing of advertising (Bower and Landreth, 2001; Petty et al., 1983). The involvement of participants with the product category of both the brands- Cars and Caps/Hats was measured with a three-item 7 point Likert scale for each product. The items were, 'Cars/Caps are part of my self-image'; 'Cars/Caps portray an image of me to others'; Cars/Caps are fascinating to me' (Micu et al., 2009).

- Need for Structure: The personal need for structure scale is used to measure individual differences in the desire for the simple structure to influence understanding, experience and interaction. The items were adapted from Neuberg and Newsom (1993) and were measured using a four-item 7-point-Likert scale, using the statements 'I enjoy having a clear and structured mode of life', 'I find that a consistent routine enables me to enjoy life more', 'I don't like situations that are uncertain', 'I hate to change my plans at the last minute'.

- Brand Familiarity: The participants' awareness and knowledge for each brand were measured using a three-item Likert scale. The items of the scale were, 'I am familiar with the Range Rover/Rewired'; I have knowledge of /about Range Rover/Rewired'; 'I have seen advertisements of Range Rover/Rewired' (Zhou et al., 2010; Steenkamp et al., 1993; Oliver and Bearden, 1985)

- Attitude towards placement: The participants' views on the use of branded products within the storyline of the television show was measured using the scale developed by Homer (2009). The attitude towards placement was measured using a three-item 7-point-Likert scale, using the statements 'I approve of studios' increased use of product placements in TV Shows', 'Using brand name products in TV shows is OK with me.', 'I do not mind seeing brand name products in TV shows as long as they are realistically shown.

5.5 Measurement Checks

All the measures of study 3 were tested for their appropriateness in measuring the relevant concepts by reliability tests. Cronbach's alpha which is a function of the number of items, the average covariance between item-pairs, and the variance of the total score, indicates the reliability of each measure (Pallant, 2013). All the measures have Cronbach's alpha of more than .80, which indicates that the measures have a good internal consistency and are reliable for further analysis (Pavot et al., 1991). Table 5.6 reports the relevant outputs for all of the one component constructs.

Table 5.6: Reliability Outputs and PCA for the one component measures

One Component Construct		Number of items	Cronbach's Alpha	Inter-item Correlations	K-M-O	Communalities	Eigenvalues	EFA Loadings
Brand Attitude	Range Rover	3	.965	.876 - .930	.767	.914 - .952	2.803	.956 -.976
	Rewired	3	.931	.786 - .842	.759	.863 .902	2.637	.929 -.950
Processing Fluency		4	.911	.579 - .851	.737	.711 - .844	3.163	.843 - .919
Privacy Concern		3	.805	.457 - .698	.659	.620 - .819	2.164	.787 - .905
Source Attractiveness	Range Rover	3	.952	.845 - .899	.767	.889 - .927	2.735	.943 - .963
	Rewired	3	.967	.896 - .917	.781	.930 - .945	2.813	.964 -.972
Programme Liking		3	.978	.916 - .973	.759	.934 - .973	2.875	.967 -.986
Programme Involvement		3	.880	.657 - .801	.720	.735 - .848	2.421	.857 - .920
Product Involvement	Range Rover	3	.954	.856 - .881	.774	.908 - .912	2.749	.953 - .964
	Rewired	3	.882	.611 - .768	.692	.771 - .885	2.430	.878 - .941
Need for Structure		4	.869	.517 - .774	.743	.681 - .751	2.873	.825 - .866
Brand Familiarity	Range Rover	3	.903	.709 - .782	.743	.819 - .872	2.513	.905 - .934
	Rewired	3	.819	.480 - .846	.630	.522 - .850	2.221	.723 - .922
Attitude towards Placement		4	.807	.400 - .762	.596	.569-.867	2.176	.754 - .931

The measures were tested for their validity in testing the relevant concepts. Firstly, the suitability of the data for principal component analysis purpose was tested. Bartlett's test of sphericity was highly significant for all the variables ($p < .001$). The correlation between the items of each measure is mostly strong ($r > .06$) with some variables exhibiting moderate strength ($r >.4$) (Cohen, 2013; Pallant, 2013). The Cronbach's alpha for all the measures is strong (> .80), which reflects the high reliability of the variables. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy represents the robustness of the identified correlation pattern (Field, 2013). All the variables are distinct and reliable as they have strong KMO scores (≥.60) (Pallant, 2013; Hutcheson and Sofroniou, 1999). All the constructs' items had the PCA loading for one single measure (with eigenvalue > 1) and, therefore, suitable for measuring one single construct (Kaiser, 1974). To summarise, all the variables appear to be distinct and measuring the relevant construct.

5.6 Results and Analysis:

5.6.1 Assumptions

The data analysis of this study tested the effect of advertising message synchronisation during media multitasking on the advertising outcomes - brand memory and brand attitude - by simple regression. The mediation of processing fluency in the relationship between advertising synchronisation and brand memory was tested by a simple mediation model suggested by Hayes (2013). The conditional model was also tested to see the moderation effect of privacy concerns and source attractiveness on the advertising synchronisation's effect on brand memory and brand attitude through processing fluency. The above tests follow Hayes's (2013) mediation and conditional analysis to explain the effects through path mediation. All the analyses were carried out using the ordinary least square regression-based path analysis and followed certain assumptions which are discussed below.

1. Independence: The collected data were independent of one another and were not influenced by another participant or measure. The experiment was conducted in a private setting, with one participant at a time. There was a buffer of 15 minutes between the end and start of an experiment session which ensured there was no interaction between the participants.

2. Multicollinearity: One of the critical assumptions in conducting the mediation and conditional analysis is to check for the relationship between the variables. It is essential to have a correlation between the variables, but the magnitude of the relationship should not be too strong (Pallant, 2013). As the independent variable is dichotomous, the issues of linearity with other variables is non-existent (Pallant, 2013). The correlation matrix of the dependent, mediator and moderator variables is presented in Table 5.7. There is a significant correlation between the variables, but none of them is strongly correlated ($r < .9$) (Pallant, 2013). The variance inflation factors (VIF) indicate the degree that the variance in the regression estimates is increased due to multicollinearity, VIF values higher than ten are considered problematic for regression. Two collinearity tests were done with Brand Memory and Brand Attitude as dependent variables to check for the VIF scores of the mediators and moderators. The VIF scores for both the tests showed no issue of multicollinearity as all the scores were less than 3. Table 5.8 presents the VIF scores for the variables.

Table 5.7: Collinearity between the Dependent Variables

	Brand Memory	Brand Attitude	Processing Fluency	Source Attractiveness	Privacy Concern
Brand Memory	1	.198* .026	.709** .000	.082 .360	.154 .086
Brand Attitude		1	.306** .000	.357** .000	.052 .562
Processing Fluency			1	.109 .223	.128 .154
Source Attractiveness				1	-.030 .742
Privacy Concern					1

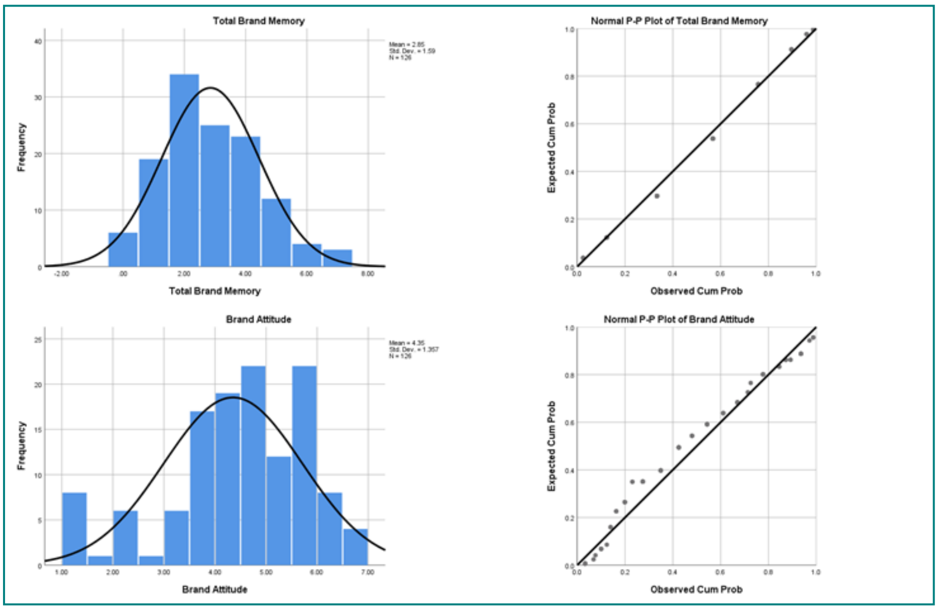
Table 5.8: Collinearity Statistics

	Brand Memory		**Brand Attitude**	
Variable	Tolerance	VIF	Tolerance	VIF
Processing Fluency	.894	1.119	.495	2.022
Source Attractiveness	.870	1.149	.986	1.014
Privacy Concern	.981	1.020	.974	1.027

3. Normality: The assumption of normality states that the dependent variable should be normally distributed. In this study, the dependent variables, brand memory and brand attitude were checked for normality by using the normality probability plots and histograms. In Figure 5.7, the left side presents the histogram, and the right side presents the normality probability plots. On the

left side of the figure, the scores of both the variables form a bell shape curve, and on the right side, the data closely follow the diagonal line. It can be confirmed that the variables are normally distributed.

Figure 5.7: Normality Testing of Dependent Variables by Histogram and PP Plots



4. Homoscedasticity: The assumption of homoscedasticity requires the scores of the variables to be equal in variance between the three conditions. Levene's test was conducted to fulfil the assumption of homogeneity of variance. All the variables were similar in their variance as their significance level was greater than .05 (Brand Memory (p = .063); Brand Attitude (p = .606); Processing Fluency (p = .178); Privacy Concern (p = .187); Source Attractiveness (p = .584). It validates the presence of homoscedasticity among all the variables.

5.6.2 Manipulation Check

An independent t-test was carried out to verify the advertising synchronisation manipulation. The participants in the synchronised advertising condition perceived the mobile advertisements to be related to the brand placements ($\bar{x}^{Sync} = 5.02$), whereas the participants in the non-synchronised advertising condition perceived the mobile advertisements to be less related to the brand placements ($\bar{x}^{Non\text{-}Sync} = 1.34$). There was a significant difference in the perception of relatedness of advertising in scores of synchronised and non-synchronised advertising conditions ($t(94) = -18.72$, $p \leq .01$). The results confirm the successful manipulation of synchronised advertising as the participants in the synchronised advertising condition perceived the mobile advertisements to be related to the TV show.

Another independent t-test was conducted to check differences between the perception of relatedness of chat messages with the stimuli between the two conditions. The results demonstrate that there was no significant difference in the perception of the relatedness of chat messages ($t(94) = .696$, $p = .488$). between the synchronised ($\bar{x}^{Sync} = 1.38$) and non-synchronised message condition ($\bar{x}^{Non\text{-}Sync} = 1.51$). As expected, the participants in both conditions perceived the text messages to be unrelated to the television show. It was essential to control for the unrelatedness of chat messages in this experiment as the relatedness could have affected the advertising outcomes.

5.6.3 Descriptive Statistics

This section provides the descriptive statistic of all the variables used in the study for both the media multitasking conditions and the single-tasking condition. The first set of control variables were general demographic questions such as age, gender and educational qualifications. The second set of control variables, such as programme liking, programme involvement, brand familiarity, product involvement, attitude towards the placement and the need for structure in their lives, were measured to identify any differences between the media conditions. Table 5.9 presents the descriptive statistics for all the control variables.

Table 5.9: Descriptive Statistics of Control Variables

Variable	**Control (N = 30)**	**NSMC (N = 49)**	**SMC (N = 47)**	**Overall (N = 126)**
Age	22.10 (4.07)	22.26 (5.40)	23.42 (4.49)	22.65 (4.78)
Gender	Male = 13 Female = 17	Male = 27 Female = 22	Male = 25 Female = 22	Male = 65 Female =61
Education	High School = 2 College = 6 Bachelors = 18 Masters = 4	High School = 3 College = 21 Bachelors = 24 Masters = 1	High School = 6 College = 16 Bachelors = 23 Masters = 2	High School = 11 College = 43 Bachelors = 65 Masters = 7
Programme Liking	3.31 (2.20)	3.32 (2.48)	3.26 (2.24)	3.29 (2.31)
Programme Involvement	4.26 (1.61)	3.23 (1.41)	3.29 (1.75)	3.50 (1.64)
Brand Familiarity	3.92 (.74)	3.74 (.78)	3.76 (.62)	3.79 (.71)
Product Involvement	2.92 (1.45)	2.87 (1.33.)	2.97 (1.37)	2.92 (1.36)

Need for Structure	4.90 (1.23)	5.04 (1.54)	4.87 (1.42)	4.94 (1.42)
Attitude towards Placements	4.82 (.86)	4.74 (1.22)	4.93 (1.12)	4.83 (1.10)

A randomisation check was conducted using ANOVA to observe any differences in the control variables for the synchronised, non-synchronised and single-tasking conditions. All the variables fulfilled the assumption of homogeneity of variance to conduct an ANOVA. The Levene test of homogeneity of variance had a significance value greater than .05 for all the variables, indicating equal variance in the scores of control variables for each of the three conditions. Age (p >.986), programme liking (p >.145), programme involvement (p >.107), brand familiarity (p >.239), product involvement (p >.981), need for structure (p >.357) and attitude towards the placement (p >.420).

The results from the one-way ANOVA indicated that there was no statistically significant difference in age (p >.380), programme liking ((p >.994), brand familiarity (p >.533), product involvement (p >.937), need for structure (p >.822), and attitude towards the placement (p >.692) between the three media multitasking conditions. There was a significant difference in the programme involvement (p >.013) between the three media multitasking conditions. The post-hoc comparison using the Tukey test revealed that the mean scores of programme involvement with the single screening condition ($\bar{X}$= 4.26, SD =1.61) were significantly higher than synchronised ($\bar{X}$= 3.23, S.D. =1.41) and non-synchronised ($\bar{X}$= 3.29, S.D. =1.75) media multitasking conditions. The participants were more involved in the programme in the single-tasking condition as they were not involved in a secondary task, unlike participants in the other two conditions. There was no statistical difference between the programme involvement of synchronised ($\bar{X}$= 3.23, S.D. =1.41) and non-synchronised ($\bar{X}$= 3.29, S.D. =1.75) media multitasking conditions.

A chi-square test was conducted to examine the effect of gender and educational qualifications on media multitasking conditions. There was no statistically significant effect of gender (p >.574) or educational qualifications (p >.158). In summary, the control variables were equally divided among the three media multitasking conditions and thus were not included in further analyses as covariates.

5.6.4 Overview of Main Effects

The means and standard deviation of the dependent variables and mediator and moderators are presented in Table 5.10, which highlights the difference between the single-tasking and the two media multitasking conditions (synchronised and non-synchronised). A one way ANOVA was conducted to establish any differences in the dependent variables, mediator and moderators between the three media multitasking conditions. There is a significant difference in brand memory between the three conditions ($F(2, 123) = 23.898$, $p < .001$). The participants in the synchronised advertising condition reported the highest brand memory, whereas the participants in the non-synchronised advertising condition reported the lowest brand memory. There was no significant difference in the brand attitude of participants in the three media multitasking conditions ($F(2, 123) = .562$, $p = .572$).

Table 5.10: Descriptive Statistics of Dependent Variables

Variable	Control (N = 30)	NSMC (N = 49)	SMC (N = 47)	Overall (N = 126)
Dependent Variables				
Brand Memory	2.60 (1.25)	2.00 (1.24)	3.89 (1.53)	2.84 (1.59)
Brand Attitude	4.50 (1.38)	4.41 (1.35)	4.19 (1.34)	4.35 (1.35)
Mediator				
Processing Fluency	4.56 (1.73)	3.63 (1.34)	4.76 (1.57)	4.27 (1.60)
Moderators				
Privacy Concerns	5.50 (.88)	5.77 (.99)	5.75 (1.00)	5.70 (.97)
Source Attractiveness	4.45 (1.75)	4.79 (1.54)	4.69 (1.41)	4.67 (1.54)

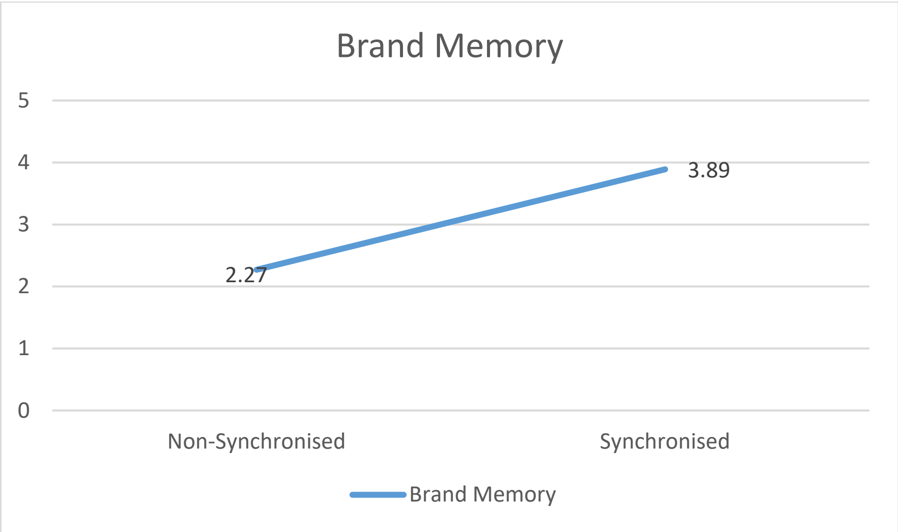
Processing fluency differed significantly between the three conditions (F(2, 123) = 7.158, *p* < .001). The participants in the synchronised media multitasking condition reported the highest processing fluency, closely followed by the participants in the single-tasking condition. The participants in the non-synchronised condition reported the lowest processing fluency. The scores of two moderators, privacy concerns (F(2, 123) = .837, *p* = .435) and source attractiveness (F(2, 123) = .446, *p* = .641) also did not differ between the three media conditions. In the next section, the individual effect of advertising synchronisation will be measured on brand memory and brand attitude.

5.6.4.1 The Effect of Advertising Synchronisation on Brand Memory

Simple regression analysis was undertaken to test the main effect of advertising synchronisation on participants' memories of the advertisements during media multitasking. The synchronised advertising condition was dummy coded as the independent variable (Advertising Synchronisation =1; Single-tasking and Non-Synchronisation = 0). Dummy coding is a simple coding structure that allows controlling a biased assessment of an independent variable by omitting another independent variable that is related to it (Fox, J., 1997; Davis, M.J., 2010). The three conditions were collapsed into two groups to evaluate the effect of synchronised ads by avoiding the bias in the assessment of its effect by eliminating similar independent variables, i.e. non-synchronised ad and single-tasking, because both the conditions used non-synchronised ads and the objective was to compare synced ads with non-synced ads.

The results reveal that when participants received the synchronised advertisement, their memory of the advertisement increased by $\beta = .509$ units ($t = 6.577$, $p < .001$) as compared to when they received advertisements in other conditions. Figure 5.8 illustrates that when people received synchronised advertisements on their television and mobile, their memory of the advertisements increased by .509 units as compared to when they did not receive any synchronised advertisements. The statistical measure of closeness of fit of the linear model, $R^2 = .259$, explains a considerable amount of variance in the viewer's brand memory. The above results support Hypothesis H10a.

Figure 5.8: Brand Memory as a function of Synchronised Advertising Condition



5.6.4.2 The Effect of Advertising Synchronisation on Brand Attitude

To test the main effect of advertising synchronisation on the viewer's attitude towards the brand shown on television, simple linear regression analysis with an advertising synchronisation condition as a dummy was undertaken. The results show that there is no significant direct effect of advertising synchronisation on brand attitude (t = -1.032, p = .304). This provides evidence that people who receive synchronised advertisements on their multiple devices while media multitasking do not have any better attitude towards the brands as compared to people who do not receive synchronised advertisements. The present test, therefore, provides substantial evidence to reject hypothesis H10b. The main effects suggest that when the advertisers on a television show target viewers with the same advertisements on their mobile while watching the television show, their brand attitude will not change, but their memory of the brands will increase (by .50 units). In the following sections, a set of mediation models will be tested to explore the underlying mechanism of brand memory and brand attitude when people are exposed to synchronised advertising while media multitasking.

5.6.5 Mediation Models

Model 1a: Mediation of Processing Fluency Mediation of Processing Fluency between Synced Ads and Brand Memory

The indirect effect of advertising synchronisation on brand memory mediated by processing fluency is tested (H11a) to uncover the mechanism that explains the main effect. In this study, a simple mediation model is tested and a mediation analysis following Hayes (2013) is run. The PROCESS computational method is used to estimate a mediation model to calculate various effects of interest by implementing a modern method of inference. Bootstrap confidence intervals are used as they are considered a more robust statistical method to calculate indirect effects (Hayes, 2013). The bootstrap method draws a random sample of *n* observations with replacement from the original sample and estimates the indirect effect for the sample. This process is repeated 10,000 times to collect the regression coefficients. This allows the PROCESS to obtain an empirical distribution of the indirect effect to derive the confidence intervals (Hayes, 2013). This method is appropriate (theoretically and statistically) for testing the mediation analysis mechanism.

Table 5.11 presents and describes the regression coefficients of the mediation paths. The total effect of advertising synchronisation on brand memory is indicated by path c; the regression coefficient *a* represents the difference between the two conditions' means of processing fluency when the advertising synchronisation is changed by one unit. Coefficient *b* represents the difference in brand memory when the two conditions differ by one unit of processing fluency but are equal in advertising synchronisation (holding advertising synchronisation constant). The multiplication *a x b* constitutes the indirect effect. The direct effect estimates the difference in brand memory when the two conditions differ by one unit of advertising synchronisation but equal on processing fluency.

A simple mediation analysis shows that advertising synchronisation indirectly influences the participants' brand memory while media multitasking due to the advertising synchronisation's effect on processing fluency. The analysis suggests that advertising synchronisation predicts the processing fluency ($F(1,124) = 7.125$, $p < .01$, $R^2 = 5.43\%$) and advertising synchronisation and processing fluency together explain the participants' brand memory ($F(2,123) = 72.937$, $p < .000$, $R^2 = 54.25\%$). As shown in Figure 5.9, when the participants receive synchronised advertisements while media multitasking as compared to non-synchronised advertisements, their processing fluency increases (a= .77) units. This increase in processing fluency results in increased brand memory during media multitasking (b = .543). The bias-corrected, 95% confidence interval for the indirect effect (ab= .41) based on 10,000 re-samples was above zero (.114 to .741). The direct effect of advertising synchronisation on brand memory (when controlling for processing fluency) is c' = 1.247 (SE = .20, p <.001). Thus, people who receive synchronised advertising messages on their multiple devices during media multitasking have better processing fluency and will, therefore, have a better memory of the advertised brands than the people who do not receive synchronised advertising messages.

Figure 5.9: Model 1a Mediation by Processing Fluency between Synced Ads and Brand Memory

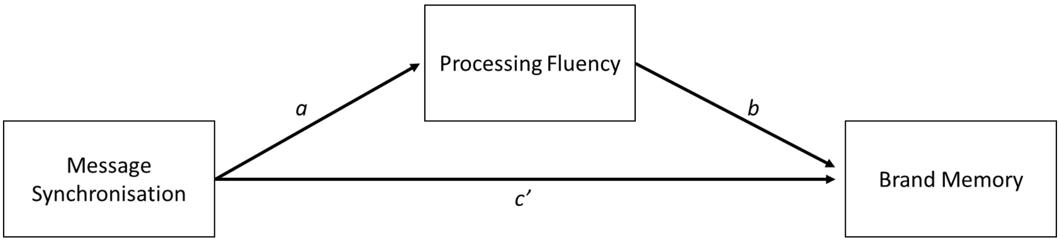


Table 5.11: Model 1a Mediation by Processing Fluency between Synced Ads and Brand Memory

Path	Coeff.	SE.	T	Sig (2-tailed)	LLCI*	ULCI*
c	1.665	.253	6.577	.0000	1.164	2.167
a	.770	.288	2.669	.0086	.199	1.341
b	.543	.062	8.736	.0000	.420	.666
c'	1.247	.205	6.073	.0000	.840	1.654
a X b	.418	.159			.114	.741

*These results for the indirect effect were calculated using the bootstrap method

In the above analysis, it is reported that the direct main effect of advertising synchronisation on brand memory (F(1,124) = 43.262, p < .001) was significant and explained 25.9% of the variation (R^2 = .259) in the participants' brand memory. This mediation analysis shows that advertising synchronisation predicts the participants' processing fluency (F(1,124) = 7.125, p <.01, R^2= 5.43%), and that advertising synchronisation and processing fluency together can better explain the participants' brand memory (F(2,123) = 72.937, p <.001, R^2= 54.25%). The participants' brand memory can be improved while media multitasking by synchronised advertising as this enhances processing fluency which ultimately results in improved memory of the brands (i.e. H11a can be accepted). The next section will test the effect of advertising synchronisation on brand attitude with processing fluency as the mediator.

Model 1b: Mediation of Processing Fluency between Synced Ads and Brand Attitude

In order to test the mediation role of processing fluency on the impact of advertising synchronisation on participants' brand attitude (H11b), the above analysis is repeated by substituting brand memory with brand attitude. The mediation analysis suggests that advertising synchronisation predicts the processing fluency (F(1,124) = .77, p< .01, R^2 = 5.43%) and the advertising synchronisation and processing fluency together explain the participants' brand attitude (F(2,123) = 8.54, p < .001, R^2 = 12.2%). As shown in Table 5.12, when the participants receive synchronised advertising while media multitasking, as compared to non-synchronised advertising, their processing fluency increases (a= .77) units. This increase in processing fluency results in increased brand attitude during media multitasking (b = .29). The bias-corrected, 95% confidence interval for the indirect effect (ab= .225) based on 10,000 resamples was entirely above zero (.053 to .436). The direct effect of advertising synchronisation on the brand attitude (when controlling for processing fluency), c' = -.48 (SE = .24, p < .05). The direct and indirect effect of advertising synchronisation on brand attitude is significant but their total effect is insignificant c = -.257 (SE = .249, p = .304). This implies that advertising synchronisation does not affect the brand attitude on its own but through processing fluency. This result is termed an indirect-only mediation as only the indirect effect is significant but the total effect is not significant (Zhao et al., 2010). Thus, people who receive synchronised advertising messages on their multiple devices during media multitasking have better processing fluency and have a more positive attitude towards the advertised brands than the people who do not receive synchronised advertising messages.

Figure 5.10: Model 1b Mediation by Processing Fluency between Synced Ads and Brand Attitude

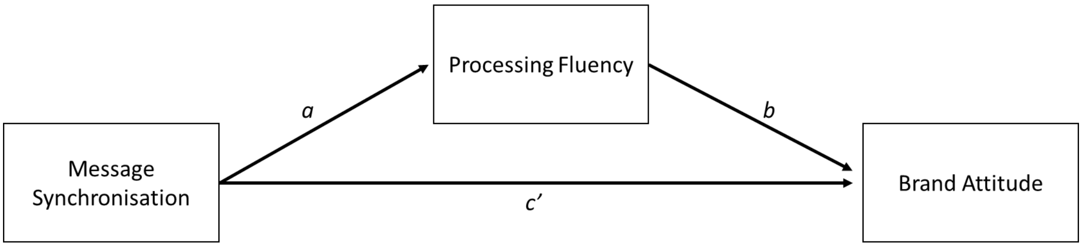


Table 5.12: Model 1b Mediation by Processing Fluency between Synced Ads and Brand Attitude

Path	Coeff.	SE.	T	Sig (2-tailed)	LLCI*	ULCI*
c	-.257	.249	-1.031	.304	-.72	.236
a	.770	.288	2.669	.0086	.199	1.341
b	.293	.073	3.987	.0001	.147	.438
c'	-.483	.242	-1.991	.0487	-.963	-.002
a X b	.225	.099			.053	.436

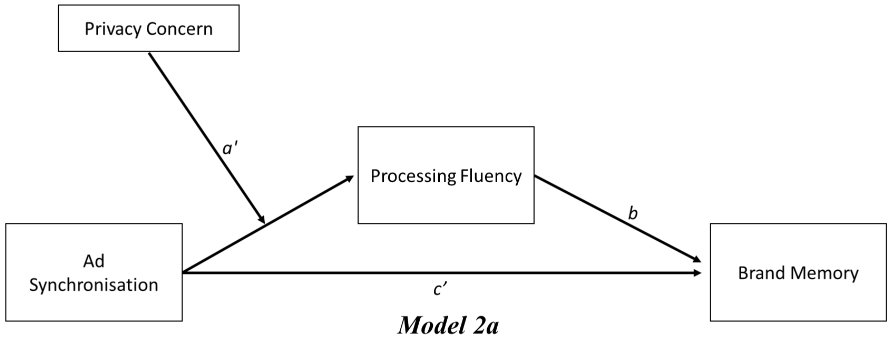
In table 5.12, a non-significant total effect of advertising synchronisation on brand attitude was identified (F(1,124) = 1.064, p = .304), which was also observed in the mediation analysis in this section (c = -.257, p = .304). The results from the mediation analyses provide a partial mediation effect of advertising synchronisation on brand attitude through processing fluency, as even after controlling for processing fluency, the direct effect of synchronised ads on brand attitude is significant. Therefore hypothesis H11b is accepted. In the next section, the role of privacy concern and source attractiveness will be tested in the mediation model for their effect on brand memory and brand attitude as conditional process models.

5.6.6 Conditional Process Models

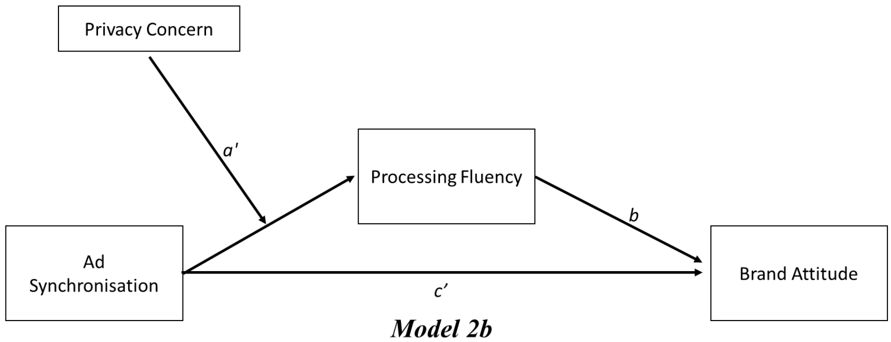
The analysis in this section seeks to determine whether consumers' level of privacy concern and their attraction towards the TV show contestants affects their memory of the brand placements and brand attitude.

Hypothesis 12a, 12b, 13a and 13b are tested through a conditional process analysis which combines the mediation (from the previous section) and moderation into a single integrated analytical model. Figure 5.11 conceptualises the analytical models that will test the six conditional process models by following the Hayes (2013) approach.

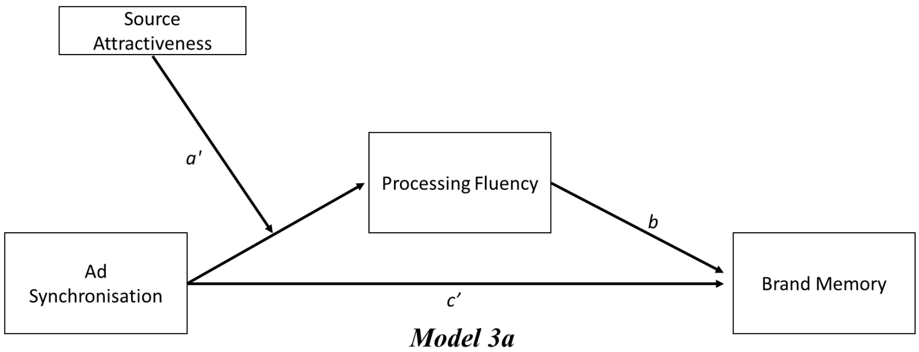
Figure 5.11: Conceptual Diagram: Moderated Mediation Conditional Models



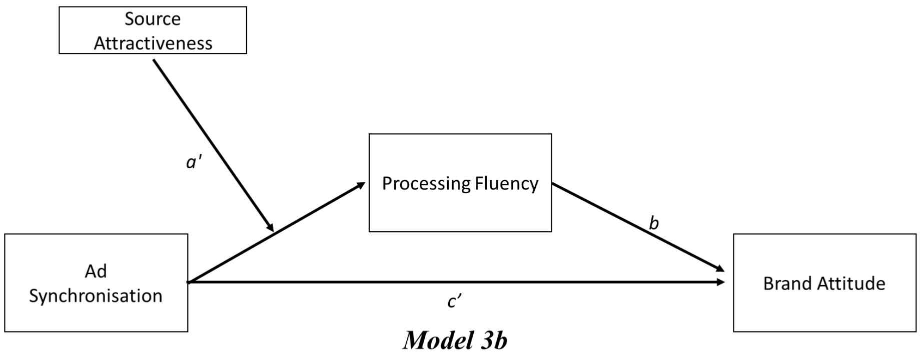
Model 2a



Model 2b



Model 3a



Model 3b

The conditional effect of privacy concern and source attractiveness are individually tested on brand memory and brand attitude. In the final section of the analysis, the two moderators are tested together to examine the process mechanism of the effect of advertising synchronisation on brand memory and brand attitude. In the following section, the role of privacy concern is individually examined.

Conditional Process: Model 2a

Hypothesis 12a is tested in the conditional process model 2a. In this model, the strength of the indirect positive impact of advertising synchronisation on brand memory via processing fluency depending on the participants' privacy concern is tested. Accordingly, path a in the previously examined simple mediation model 1a is now moderated by privacy concern. Privacy concern is mean-centred (deducting from the initial values the mean value of the variable, M= 5.70, SD = .97) to ease the interpretation of the results. The interpretation of the results will have as a reference point, the individuals with an average privacy concern rather than those with privacy concern = 0. It is important as the boundaries for the privacy concern scale were set in the study to take on values between 1 and 7. Therefore, having as a reference point, people with privacy concern = 0, or even closer to the scale's minimum boundary, will bear little empirical relevance.

The regression coefficients for advertising synchronisation and privacy concern in the model of processing fluency constitute regression effects. Accordingly, and as Table 5.13 illustrates, *a1* estimates the effect of advertising synchronisation on processing fluency for individuals with average privacy concern. This effect is negative and statistically significant (a^1 = -6.371, p <0.01). The regression coefficient a^2 estimates the effect of privacy concern on processing fluency among those assigned to the non-synchronised advertisements. The effect of privacy concern on processing fluency is insignificant (*a2*

= -0.35, *p <.001*). More importantly, the moderation of the path *a* (Advertising Sync → Processing Fluency) is evidenced here by the statistically significant interaction between advertising synchronisation and privacy concern in the model of processing fluency (*a3* = 1.24, p < 0.001). Thus, coefficient *a3* is important because this model represents the two-way interaction. It also tells us that there is moderation and that the strength of the effect of advertising synchronisation on processing fluency depends on privacy concern. Specifically, the regression coefficients of the product of advertising synchronisation and privacy concern (*a3*) quantify how the effect of advertising synchronisation on processing fluency changes as privacy concern increases by one unit. Thus, as privacy concern increases by one unit, the difference in processing fluency between those in the advertising synchronisation and the advertising non-synchronisation condition increases by 1.24 units.

Table 5.13: Model Coefficients for the Conditional Process Model 2a

		Consequent						
		Mediator (Processing Fluency)				(Y) Brand Memory		
Antecedent		Coeff.	SE	*p*		Coeff	SE	*p*
Sync Cond	*a1*	-6.371	.987	*.000*	*c'*	1.247	.205	*.000*
Fluency	-	-	-	-	*b*	.543	.062	*.000*
Privacy Concern	*a2*	-.355	.171	*.040*	-	-	-	
Sync Cond X Privacy Concern	*a3*	1.24	.27	*.000*	-	-	-	-
Constant	*i*	6.005	.987	*.000*	*i*	.060	.276	*.827*

R^2=.197	R^2=.542
F(3.122)=9.979, p < .001	*F(2.123)=72.937, p < .001*

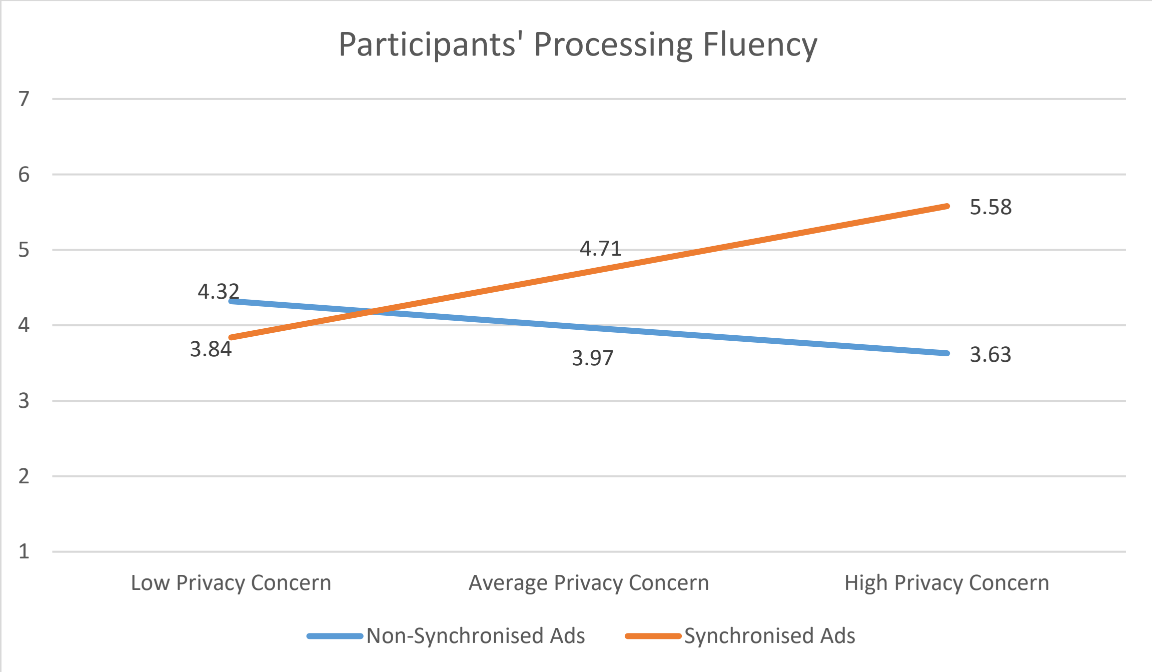
Table 5.13 summarises the necessary evidence to build the conditional process model, but it does not show wherein the distribution of privacy concern, advertising synchronisation has or does not have an effect on brand memory that is different from zero (i.e., it does not provide information for the magnitude of the discrepancy in brand memory between the two conditions). Marketing managers, for instance, would be interested to know how the strength of the effect (of advertising synchronisation on brand memory) varies according to privacy concern. Thus, it is a common practice among researchers to run an additional inferential test, which is commonly known as 'probing' an interaction (see Hayes, 2013). This procedure involves three general steps: (1) selecting a value(s) of the moderator (privacy concern), (2) calculating the conditional effect of advertising synchronisation on brand memory via processing fluency at the selected values of privacy concern, and (3) calculating an inferential test or generating a confidence interval to show for which values of privacy concern there is an indirect effect of advertising synchronisation on brand memory, that is different from zero.

The present study follows Aiken and West's (1991) approach to visualising and probing an interaction, which is also known as simple slopes or spotlight analysis. This approach is appropriate when the moderator is a quantitative/continuous variable. The conditional effect of advertising synchronisation on brand memory via processing fluency is estimated when privacy concern is equal to the mean, one standard deviation below the mean and one standard deviation above the mean. It allows us to ascertain whether advertising synchronisation is related to brand memory among those with 'relatively low' (Mean-1SD), 'moderate' (Mean), and 'relatively high' (Mean + 1SD) privacy concern.

With this information, it will be easy to visualise the interaction (i.e., provide useful 'descriptive' insights) and also run simple slopes tests to determine under what conditions (values of privacy concern) the advertising synchronisation-brand memory relationship is statistically significant (i.e., provide 'inferential' p-values insights). This two-step procedure is described below.

Figure 5.12 provides a visual representation of the conditional effect of advertising synchronisation on brand memory among those individuals who are relatively low (privacy concern = -.97), moderate (Privacy concern =*0)* and relatively high (Privacy concern = +.97) in privacy concern. Among the average privacy concern, the processing fluency of people receiving synchronised advertisements was .74 units higher than the people who received non-synchronised advertisements. The a' denotes the size of the gap (vertical difference) between the two lines. This difference a' between the two advertising synchronisation conditions (can be seen in Figure 5.12), increases when people's privacy concern is increasing. For those with higher privacy concern, this difference is 1.95 units. Whereas, for people with lower privacy concern this difference becomes inverse (a'= -.47), to a degree when processing fluency is higher for people with non-synchronised advertisements as compared to people with synchronised advertisements

Figure 5.12: Visual representation of the moderation effect of advertising synchronisation on the participants processing fluency as a function of privacy concern.



The moderation path of this model does not change the indirect effect of advertising synchronisation on brand memory through processing fluency, which is still the product of two paths of influence (*a x b*) (Hayes, 2013). The major change is that the indirect effect is now a product involving [a' = (a^1+a^3 privacy concern) b]. It also makes the indirect effect a function of the privacy concern, which influences the size of the effect in this causal-type system. In this model, path b is unconditional upon privacy concern (the relationship of processing fluency and brand memory does not depend on privacy concern), but the total indirect effect of advertising synchronisation will be conditional on privacy concern. The next step of this analysis will follow the Aikin and West (1991) estimation of the conditional indirect effect of the three values of privacy concern along with an inferential test at those values to determine if the slope was statistically different from the zero at that point.

The conditional indirect effect ω (a' x b) of advertising synchronisation on brand memory is positive for all the values of privacy concern and increases as participants' levels of privacy concern increase. Only at a lower level of privacy concern, is the conditional indirect effect not statistically different from zero (based on 95% bootstrap confidence interval) but at the medium and high levels, it is statistically different from zero. The results from this model confirm hypothesis 12a, according to which the indirect positive effect of advertising synchronisation on brand memory through the increase in processing fluency of the brands depends positively and linearly on consumers' levels of privacy concern during media multitasking. However, the processing fluency effects from non-synchronised to synchronised advertising resulting in significant brand memory was found only for the people with a medium or high level of privacy concern. On the other hand, for people with a lower level of privacy concern, the synchronised advertisements while media multitasking did not have a substantial effect on processing fluency and therefore, their brand memory was also not affected by the synchronisation of the advertisements.

Table 5.14: Model Co-efficients for the Conditional Indirect Effect of Synchronised Advertising on Brand Memory through Processing Fluency for various values of Privacy Concern

Indirect Effects				
Privacy Concern	a' = a^1+a^3 Privacy Concern	b	ω	95% bias correlated bootstraps CI
Low (-.97)	-.47	.543	-.25	-.6357 to .1290
Medium (0.00)	.74	.543	.40	.1356 to 6748
High (+97)	1.95	.543	1.05	.6444 to 1.4712

In summary, participants with a higher level of privacy concern have higher processing fluency when experiencing synchronised advertising while media multitasking. This suggests that for people with greater privacy concern, the processing fluency and therefore, the memory of the brands can be substantially affected (increased) by the synchronisation of advertisements.

Conditional Process Model 2b

This section replicates the previous analysis by replacing the brand memory with brand attitude in the conditional processing model 2b and tests the hypothesis H12b. This model tests whether the strength of the indirect positive effect of synchronised advertising on brand attitude through the enhancement of processing fluency depends on the privacy concern of the participants.

Table 5.15 presents the model coefficients for model 2b. The a^1,a^2 and a^3 estimates are the same as in model 2a.

Table 5.15: Model Coefficients for the Conditional Process Model 2b

	Consequent Mediator (Processing Fluency)							(Y) Brand Attitude
Antecedent		Coeff.	SE	*p*		Coeff	SE	*p*
Sync Cond	*a1*	-6.371	1.590	*.000*	*c'*	-.483	.242	*.048*
Fluency	-	-	-	-	*b*	.293	.073	*.000*
Privacy Concern	*a2*	-.355	.171	*.040*	-	-	-	
Sync Cond X Privacy Concern	*a3*	1.24	.274	*.000*	-	-	-	-
Constant	*i*	6.005	.987	*.000*	*i*	3.280	.326	*.000*
	R^2=.197 *F(3.122)=9.979, p < .001*				R^2=.122 *F(2.123)=8.546, p< .001*			

The effect of privacy concern on processing fluency is the same as in the previous model *2a*, where the difference in processing fluency increases as the participant's privacy concern increases.

In this moderated mediation model 2b, although path *b* (Processing Fluency →Brand Attitude) is unconditional (i.e. the relationship between the processing fluency and brand attitude does not depend on privacy concern), the total indirect effect of synchronised advertising on brand attitude is conditional on privacy concern. Therefore, the conditional indirect effect for the three values (Mean –SD; Mean; Mean + SD) of privacy concern is estimated, along with an inferential test at those values. In Table 5.16, the conditional indirect effect (*a'* x *b*) of synchronised advertising on brand attitude depend positively and linearly on the privacy concern of the participants. However, at the low level of privacy concern, the conditional indirect effect is not statistically different from zero (based on a 95% bootstrap confidence interval). The effect of processing fluency on brand attitude from synchronised advertising was found to occur only for those people with a higher or at least a moderate level of privacy concern. These participants' processing fluency and in turn, their brand attitude increased when they experienced synchronised advertising. In contrast, synchronised advertising did not have any effect on processing fluency and brand attitude with people low in privacy concern.

Table 5.16: Model Co-efficients for the Conditional Indirect Effect of Synchronised Advertising on Brand Attitude through Processing Fluency for various values of Privacy Concern

Indirect Effects				
Privacy Concern	a' = a^1+a^3 Privacy Concern	b	ω	95% bias correlated bootstraps CI
Low (-.99)	.47	.293	-.13	-.3870 to .0624
Medium (0.00)	.77	.293	.21	.0574 to .4122
High (+99)	1.94	.293	.57	.2514 to .9698

In summary, participants with greater privacy concern have a higher processing fluency when they experience synchronised advertising. Greater privacy concern leads to higher processing fluency and increased effect on the brand attitude by synchronised advertising. The above results support hypothesis 12b. In the next section, the moderating role of source attractiveness will be tested by the same process.

Conditional Process Model 3a

Hypothesis H13a will be tested in this conditional process model 3a. This model investigates the conditional nature similar to the previous model process, where synchronised advertising affects brand memory through the decrease in processing fluency via the increase in source attractiveness. As per H13a, the strength of this indirect negative effect depends on source attractiveness. The path *a* in the simple mediation model presented in Model 2a (see figure 5.11) is now moderated by source attractiveness.

The regression coefficients for synchronised advertising and source attractiveness constitute conditional effects. Table 5.17, a^1 estimates the effect of synchronised advertising on processing fluency for individuals with average source attractiveness. This effect is positive and statistically different from zero ($a^1 = 3.966$, $p < 0.001$). It indicates that for the people with an average level of source attractiveness towards the endorsers, the difference in their processing fluency of the advertising message increases by 3.966 units when the advertisements are synchronised while media multitasking as compared to when they are not synchronised. The regressions coefficients a^2 shows that when their source attractiveness increases by one unit for the participants assigned in the non-synchronised advertising condition, their processing fluency increases by 0.321 units. The path *a* (Sync Advertising → Processing Fluency) in this model is moderated by source attractiveness, which is evidenced by the statistically significant interaction between synchronised advertising and source attractiveness ($a^3 = -.682$, $p < 0.001$). It suggests that respondents' source attractiveness towards the endorser's increases by one unit, the difference in the processing fluency between those in the non-synchronised advertising condition and the synchronised advertising condition decreases by .682 units. It might suggest that people with high attraction towards the source of advertising have a major impact on their processing fluency when exposed to synchronised advertising. The source of advertisements in this experiment were product placements in the television show Love Island, which included attractive contestants in their beach attire (bikinis and swimming shorts).

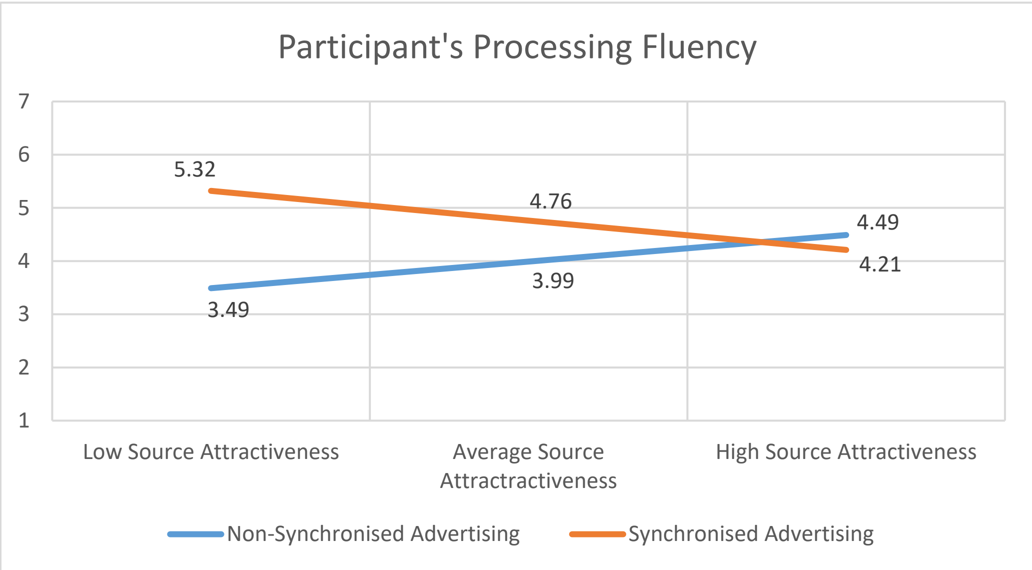
Table 5.17: Model Coefficients for the Conditional Process Model 3a

	Consequent								
	Mediator(Processing Fluency)				(Y) Brand Memory				
Antecedent		Coeff.	SE	*p*		Coeff	SE	*p*
Sync Cond	*a1*	3.966	.918	*.000*	*c'*	1.247	.205	*.000*
Fluency	-				*b*	.543	.062	*.000*
Source Attractiveness	*a2*	.321	.103	*.002*	-			
Sync Cond X Source Attractiveness	*a3*	-.682	.187	*.000*	-			
Constant	*i*	2.490	.512	*.000*	*i*	.060	.276	*.827*
	R^2=.157				R^2=.542			
	F(3.122)=7.615, p < .001				*F(2.123)=72.937 p<.001*			

Table 5.17 clearly illustrates the strength of relationships among the variables for model 3a. However, to provide further insights about the magnitude of the discrepancy in processing fluency and brand memory between the two synchronised advertising conditions, the same Aiken and West's (1991) approach is followed. In this approach (probing an interaction) and estimating first the conditional effect of synchronised advertising on brand memory via processing fluency when the source attractiveness is equal to the mean, one standard deviation below and one standard deviation above the mean is undertaken. Accordingly, Figure 5.13 constitutes a visual representation of the conditional effect of synchronised advertising on processing fluency for those individuals who are relatively low (Source attractiveness = -1.54), average (Source attractiveness = 00) and relatively high (Source attractiveness = 1.54) source attractiveness. Among

people with average source attractiveness, the processing fluency for those in non-synchronised advertising conditions is .77 units lower than the people who received synchronised advertising. The difference in processing fluency decreases and reduces to .28 units in the higher level of source attractiveness between the two synchronised advertising conditions. With regard to the processing fluency of participants in the high source attractiveness, the participants in the synchronised advertising condition have .28 units less processing fluency than the participants in the non-synchronised advertising condition. However, for participants in the low level of source attractiveness, the difference is massive initially (*a*`= 1.83), which gradually reduces as the level of source attractiveness increases.

Figure 5.13: A Visual Representation of the Moderation of the Effect of Synchronised Advertising on Processing Fluency as a function of Source Attractiveness.



Given that path *a* (i.e., Synchronised Advertising → Processing Fluency) is moderated by source attractiveness and, although path *b* (Processing Fluency → Brand Memory = .543) remains unconditional (i.e., the relationship between processing fluency and brand memory does not depend on source attractiveness), the total indirect effect of synchronised advertising will also be conditional on source attractiveness. Table 5.18 illustrates the conditional indirect effect (*a` X b)* of synchronised advertising on brand memory. For people with average or lower source attractiveness, the indirect effect of synchronised advertising on brand memory through processing fluency is negative and decreases as the level of source attractiveness increases. However, among those with higher source attractiveness, the conditional indirect effect is negative and is not statistically significant. Based on the 95% bootstrap confidence interval for participants with high source attractiveness, the effect of synchronised advertising on their brand memory via its effect on processing fluency produced no difference between the two advertising conditions. In this model, there is evidence that the change in the advertising conditions during media multitasking can affect brand memory (c`= 1.247 p <.01). So, synchronised advertising can decrease the brand memory of the products advertised while media multitasking by decreasing the processing fluency dependent on the attractiveness of the source of advertising.

Table 5.18: The Model Coefficients for the Conditional Indirect Effect of Synchronised Advertising on Brand Memory for various values of an individual's Source Attractiveness.

Indirect Effects				
Source Attractiveness	a' = a^1+a^3 Source Attractiveness	b	ω	95% bias correlated bootstraps CI
Low (-1.47)	1.83	.543	.99	.5333 to 1.4795
Medium (0.00)	.77	.543	.42	.1320 to .7220
High (+1.47)	.28	.543	-.15	-.6002 to .3010

The results confirm Hypothesis 13a, as the results show that indirect negative effect of synchronisation of advertising during media multitasking on brand memory through the decrease in processing fluency depends negatively and linearly on the attractiveness of the source of advertising. These findings are only valid people for people with average or below average attraction towards the source of advertising. In particular, when the participants have higher source attraction, there is no difference in brand memory via processing fluency between the two advertising conditions; that is, synchronised advertising and non-synchronised advertising during media multitasking.

Conditional Process Model 3b

The analysis of this model is similar to the previous model 3a. This time brand memory is replaced by brand attitude. This model tests whether the strength of the indirect negative impact of synchronised advertising on brand attitude through the reduction of processing fluency depends on the participants' attraction towards the source of advertisement. Path *a* (see figure 5.11) is tested to uncover moderation of source attractiveness (which is mean-centred). Table 5.19 presents the model coefficients for model 3b. The a^1,a^2, and a^3 estimates are the same as in model 3a.

Table 5.19: Model Coefficients for the Conditional Process Model 3b

	Consequent Mediator (Processing Fluency)				(Y) Brand Attitude			
Antecedent		Coeff.	SE	*p*		Coeff	SE	*p*
Sync Cond	*a1*	3.966	.918	*.000*	*c'*	-.483	.242	*.048*
Fluency	-				*b*	.293	.073	*.000*
Source Attractiveness	*a2*	.321	.103	*.002*	-			
Sync Cond X Privacy Concern	*a3*	-.682	.187	*.000*	-			
Constant	*i*	2.490	.512	*.000*	*i*	3.280	.326	*.000*
	$R^2=.157$ $F(3.122)=7.615, p < .001$				$R^2=.122$ $F(2.123)=8.546, p < .001$			

The effect of source attractiveness on processing fluency is the same as in the previous model *3a*, where the difference in processing fluency decreases as the participant's source attractiveness increases.

With evidence that path *a* (i.e., Synchronised Advertising → Processing Fluency) is moderated by source attractiveness and path *b* (Processing Fluency → Brand Attitude) is unconditional (i.e., the relationship between processing fluency and source attractiveness does not depend on source attractiveness), the total indirect effect of synchronised advertising on brand attitude will also be conditional on source attractiveness. Table 5.20 presents his conditional indirect effect (*a X b*). For people with average and below-average source attraction, the indirect effect of synchronised advertising on brand attitude through processing fluency is positive and decreases as source attractiveness increases. However, when source attractiveness is relatively high, the total conditional indirect effect is negative and not statistically different from zero based on 95% bootstrap CI. In this model, there is evidence that synchronised advertising can directly influence brand attitude ($c' = -.483$, $p < .05$). So, synchronised advertising results in a decrease in the brand attitude of advertisements shown during media multitasking by decreasing the processing fluency, but this effect is found to rely on the participants' attraction towards the source of advertisement.

Table 5.20: Model coefficients for the conditional indirect effect of synchronised advertising on brand attitude through processing fluency for various values of an individual's source attractiveness.

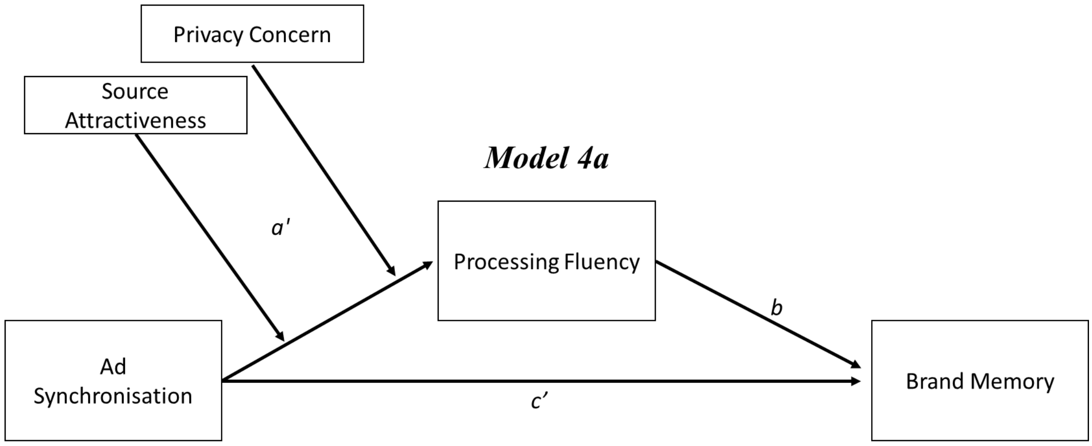
Indirect Effects				
Source Attractiveness	a' = a^1+a^3 Source Attractiveness	b	ω	95% bias correlated bootstraps CI
Low (-1.47)	1.83	.293	.53	.2277 to .9220
Medium (0.00)	.77	.293	.22	.0616 to .4278
High (+1.47)	.28	.293	-.08	-.3566 to .1554

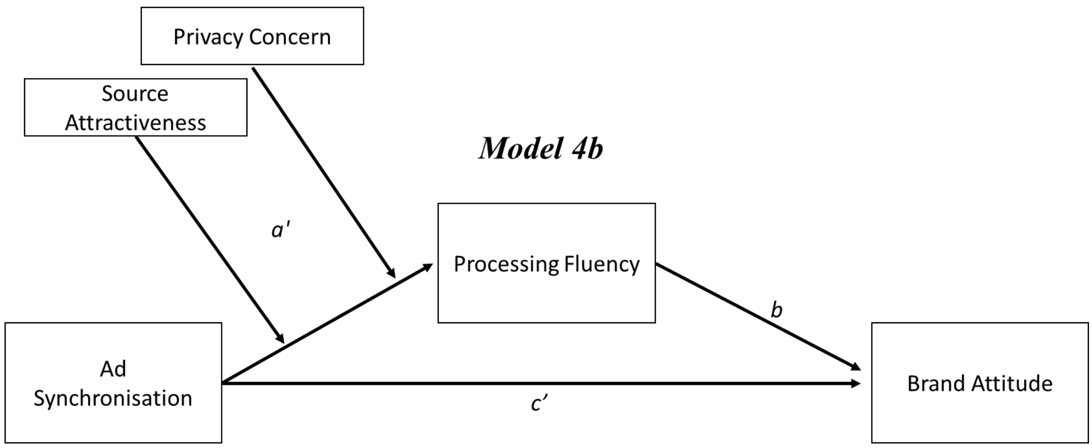
These results confirm hypothesis H13b because they show that the indirect negative influence of synchronised advertising on the brand attitude through the decrease in processing fluency for the advertised brands during media multitasking depends negatively and linearly on the participants' attraction towards the source of advertisements. In the next section, a conditional process model will be tested, which will include both the moderators to the model of processing fluency mediating the effect of advertisement synchronisation on brand memory and brand attitude.

5.6.7 Multiple Moderation Analysis

The two moderating variables - privacy concern and source attractiveness - are not correlated (r=.016, p= .88). However, they both moderate (in separate moderated mediation models) the indirect effect of synchronised advertisements on brand memory and brand attitude through processing fluency. Therefore, PROCESS model 9 in SPSS was used to test the mediation moderation effect of both potential moderators (privacy concern and source attractiveness) together to test the hypothesis H14a and H14b. Figure 5.14 visually describes the conceptual models to be tested. The moderators will be tested in the same model to avoid omitted variable bias and, most importantly, to test whether privacy concern and source attractiveness overlap each other's effect on brand memory and brand attitude.

Figure 5.14: Conceptual diagram: Representation of the conditional models moderated by privacy concern and source attractiveness.





Conditional Process Model 4a

The moderating effects of privacy concern and source attractiveness, when entered separately in the model(s) of the indirect effect of synchronisation of advertisements on brand memory, were significant. The present section introduces the two moderators (Privacy concern and Source attractiveness) together into the same model as a conditional process model. The conditional process analysis is tested, placing privacy concern and source attractiveness in conditional model 4a that tests hypothesis 14a. The aim here is to test whether the strength of the indirect positive impact of synchronised advertising on brand memory through the enhancement of processing fluency depends on the participants' levels of privacy concern and source attraction. Accordingly, the path *a'* of the simple mediation model (see figure 5.14) is tested to uncover moderation by both source attraction and privacy concern. Both the moderators are mean centred (Privacy Concern = 5.70; Source Attractiveness = 4.67).

In this model of multiple moderators, the regression coefficients a^1, a^2 and a^3 constitute conditional effects. In Table 5.21, a^1 estimates the effect of synchronised advertisements on processing fluency for the participants with both average privacy concern and source attraction. This effect is negative and insignificant (a^1= -3.340, p= .06). The regression coefficient of a^2 estimates the conditional effect of privacy concern on processing fluency among those assigned to the non-synchronised advertising condition and holding source attraction constant, while a^3 estimates the conditional effect of source attraction on processing fluency among those assigned to the same non-synchronised advertising condition but holding privacy concern constant. Accordingly, for participants assigned to the non-synchronised advertising condition, statistically significant difference (a^2= -.373,p <.05) was identified in the participants' processing fluency when the level of privacy concern increased by one unit (keeping source attractiveness constant), whereas in the same non-synchronised advertising condition, the processing fluency increased by .328 units (a^3= .328, p <.001) when there was an increase in one unit of source attractiveness (keeping privacy concern constant).

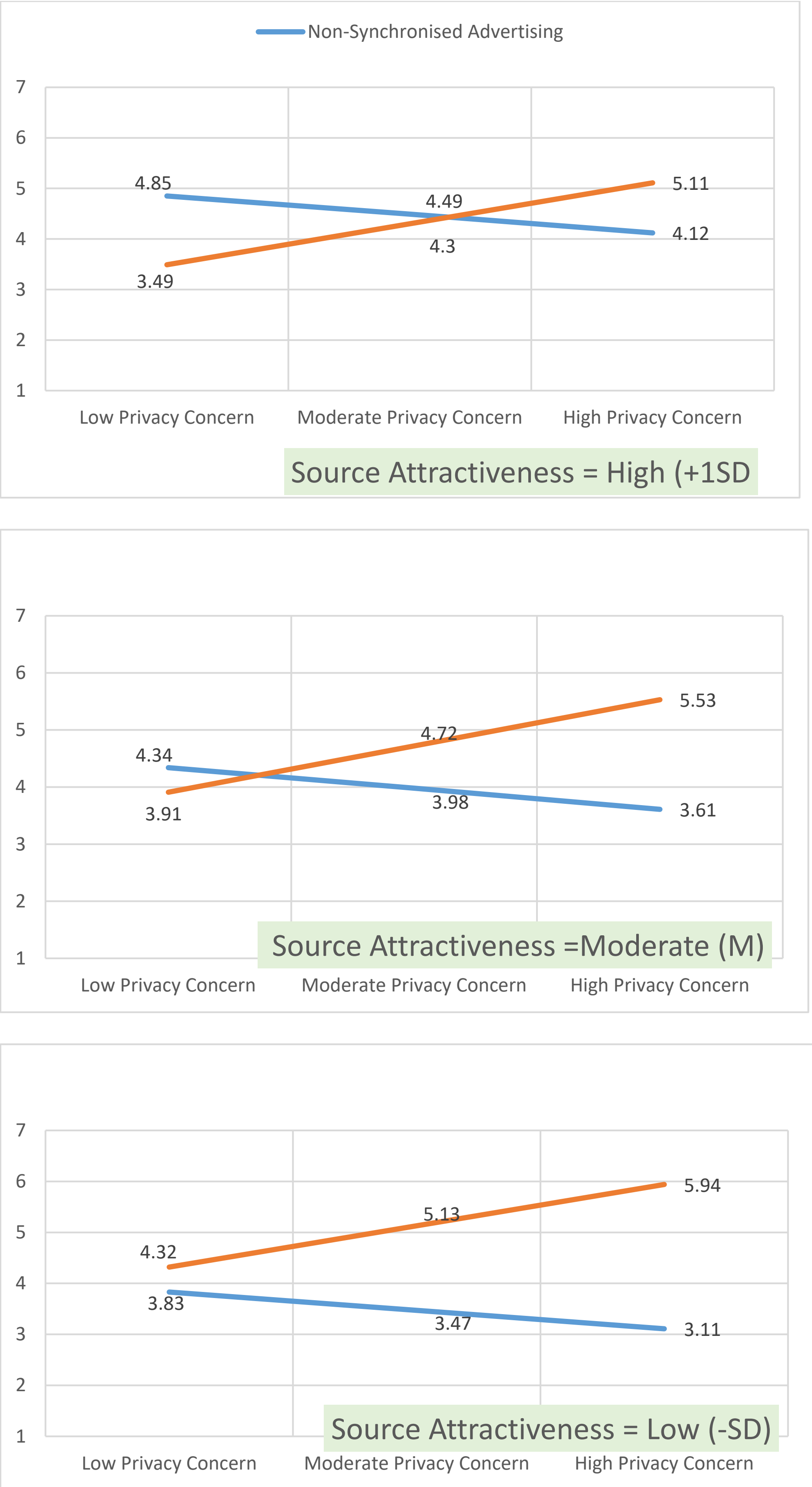
Table 5.21: Model Coefficients for the Conditional Process Model 4a

		Consequent						
		Mediator (Processing Fluency)				(Y) Brand Memory		
Antecedent		Coeff.	SE	*p*		Coeff	SE	*p*
Sync Cond	a^1	-3.340	1.794	*.065*	c'	1.247	.205	*.000*
Fluency	-				b	.543	.062	*.000*
Privacy Concern	a^2	-.373	.163	*.023*				
Source Attractiveness	a^3	.328	.096	*.000*	-			
Sync Cond X Privacy Concern	a^4	1.206	.262	*.000*	-			
Sync Cond X Source Attractiveness	a^5	-.598	.175	*.000*				
Constant	i	4.576	1.027	*.000*	i	.060	.276	*.827*
		$R^2=.286$				$R^2=.542$		
		$F(5.120)=9.63, p < .001$				$F(2.123)=72.93, p<.001$		

More importantly, the path *a* (Synchronised Advertising → Processing Fluency) in the conditional process model is found to be moderated by privacy concern which is evidenced by the statistically significant interaction between synchronised advertising and privacy concern in the model of processing fluency (a^4= 1.206, p= <0.001). It indicates that holding source attractiveness constant, as the level of privacy concern increases by one unit, the difference of processing fluency between the two advertising conditions (non-synchronised versus synchronised) increases by 1.206 units. Path *a* is also moderated by source attractiveness (a^5= -.598, p= <0.001), which is also statistically significant in the model of processing fluency. It implies that as the level of source attractiveness increases by one unit, processing fluency between the two advertising conditions (non-synchronised versus synchronised) decreases by .598 units. With evidence that path *a* (Synchronised Advertising → Processing Fluency) is moderated by both privacy concern and source attractiveness and path *b* (Processing Fluency → Brand Memory) is unconditional, the total indirect effect of synchronised advertising will also be conditional on privacy concern and source attractiveness.

Although Table 5.21 summarises the necessary evidence for building conditional process model 4a, it does not provide information as regards the magnitude of the effect of synchronisation on brand memory between the two conditions. Thus, following Aiken and West (1991) again, additional inferential tests (probing interaction) are presented to estimate the conditional effect of synchronisation of advertising on brand memory via processing fluency for the nine conditions. These nine conditions combine privacy concern when it is 'relatively low' (Mean -1 SD), 'moderate' (Mean), and 'relatively high' (Mean + 1SD) (and source attractiveness is constant) with the three values of source attractiveness (relatively low = Mean-1SD, moderate = Mean, and relatively high = Mean + 1SD) when privacy concern is constant. Figure 5.15 visually shows the conditional effect of synchronisation of advertising on processing fluency for the nine different value-combinations of privacy concern (depicted on the horizontal axis) and source attractiveness (depicted by the three different diagrams in Figure 5.15).

Figure 5.15: A Visual Representation of the Conditional Effect of Synchronised Advertising on Processing Fluency as a function of Privacy Concern and Source Attractiveness



It can be observed in all three diagrams in figure 5.15, that the increase in processing fluency in the synchronised advertising condition as compared to processing fluency in the non-synchronised advertising condition becomes substantial (significant) when participants' levels of privacy concern range between average and high (in the middle and right part of the diagrams). However, when the participants' levels of source attraction are higher (see top diagram), the difference in processing fluency decreases.

Indeed, as table 5.22 illustrates, the conditional indirect effect (*a' X b)* differs in sign and significance across the nine value combinations of privacy concern and source attractiveness. In particular, for people with low privacy concern, the total conditional indirect effect is not statistically different from zero, based on a 95% bootstrap confidence interval, when source attraction is average or above average. Also, for those with average privacy concern and high source attraction, the conditional indirect effect is not statistically significant. As both the moderators, privacy concern (a^4=1.20) and source attractiveness (a^5= -.538), do not have a significant difference in their effects in terms of absolute magnitude. The indirect effect of synchronised advertising on brand memory for participants with higher privacy concern is significantly positive but decreases as the source attractiveness increases. For participants with average source attractiveness, the indirect effect of synchronised advertising on brand memory is initially negative but increases significantly as privacy concerns increase.

Table 5.22: Model coefficients for the conditional indirect effect of synchronised advertising on brand memory through processing fluency for various nine value-combinations of privacy concern and source attractiveness.

Indirect Effects					
Privacy Concern	Source Attractiveness	a' = a^1+a^4 Privacy Concern + a^5 Source Attractiveness	b	ω	95% bias correlated bootstraps CI
-.97	-1.54	.49	.543	.266	-.2479 to .8651
-.97	0.00	-.43	.543	-.235	-.6268 to .1836
-.97	+1.54	-1.36	.543	-.736*	-1.2255 to -.2385
0.00	-1.54	1.66	.543	.903*	.5088 to 1.3631
0.00	0.00	.74	.543	.402*	.1426 to .6772
0.00	+1.54	-.19	.543	-.098	-.5199 to 3410
+.97	-1.54	2.83	.543	1.541*	1.0651 to 2.0320
+.97	0.00	1.92	.543	1.040*	.6666 to 1.4381
+.97	+1.54	.99	.543	.538*	.0164 to 1.1022

Consequently, H14a is rejected, as the mechanism by which the synchronisation of advertising increases brand memory through the increase of processing fluency depends positively and linearly on the individual's level of privacy concern and negatively on their attraction towards the source of advertising. However, this assumption is valid among people with average or above-average privacy concern. Source attraction has a moderating effect in the mechanism mentioned above, but its effect is slightly smaller and opposite in direction from that of privacy concern. By putting the moderating powers of privacy concern and source attraction into the same conditional model, it is concluded that the negative effect of source attraction diminishes part of the positive effect of privacy concern on processing fluency.

Conditional Process Model 4b

The conditional process model 4b tests this study's final hypothesis H14b. In particular, it tests whether the strength of the indirect effect of advertisement synchronisation on brand attitude through processing fluency depends on the participants' levels of privacy concern and source attraction.

In this model, the regression coefficients $a^{1,}$ a^2,a^3, a^4 and a^5 have the same conditional effects as in the previous model 4a. Table 5.23 presents the coefficients for the conditional model 4b. The results are the same as in the previous model 4a as the same variables are tested, the path *a* (Synchronised advertising → Processing Fluency) is moderated by both privacy concern and source attractiveness. The path *b* (Processing Fluency → Brand Attitude) is different in this model and is unconditional. The total indirect effect of synchronised advertising will be conditional on privacy concern and source attractiveness

Table 5.23: Model Coefficients for the Conditional Process Model 4b

Consequent								
	Mediator (Processing Fluency)				(Y) Brand Attitude			
Antecedent		Coeff.	SE	*p*		Coeff	SE	*p*
Sync Cond	a^1	-3.340	1.794	*.065*	*c'*	-.4834	.242	*.048*
Fluency	-				*b*	.293	.073	*.000*
Privacy Concern	a^2	-.373	.163	*.023*				
Source Attractiveness	a^3	.328	.096	*.000*	-			
Sync Cond X Privacy Concern	a^4	1.206	.262	*.000*	-			
Sync Cond X Source Attractiveness	a^5	-.598	.175	*.000*				
Constant	*i*	4.576	1.027	*.000*	*i*	3.280	.326	*.000*
	R^2=.286				R^2=.122			
	$F(5.120)=9.63, p < .001$				$F(2.123)=8.546, p<.001$			

The conditional indirect effect (a' x b) across the nine value-combinations of privacy concern and source attractiveness are illustrated in Table 5.24. The values of the conditional indirect effect differ in sign and significance across the nine value-combinations of privacy concern and source attractiveness. The conditional indirect effect on brand memory in the previous section is similar to the conditional indirect effect on brand attitude. In particular, for people with a low level of privacy concern, the total conditional indirect effect is statistically insignificant as it is different from zero, based on a 95% bootstrap confidence interval when source attraction ranges between average or high level. Similarly, for those with average privacy concern and high source attraction, the conditional indirect effect is statistically insignificant as both the moderators, privacy concern (a^4= 1.206) and source attractiveness (a^5= -.598), do not have a significant difference in their effects in terms of absolute magnitude. Thus, all the cases with higher levels of privacy concern and all the cases with a lower level of source attractiveness are statistically significant and different from zero. For participants with average or above-average privacy concerns, the indirect effect of synchronised advertising on brand attitude is positive and increases as privacy increases, while for participants with average or below average source attractiveness, the indirect effect of synchronised advertising on brand attitude is positive and decreases as source attractiveness decreases.

Table 5.24: Model Coefficients for the Conditional Indirect Effect of Synchronised Advertising on Brand Attitude through Processing Fluency for various nine value-combinations of Privacy Concern and Source Attractiveness.

Indirect Effects					
Privacy Concern	Source Attractiveness	a' = a^1+a^4 Privacy Concern + a^5 Source Attractiveness	b	ω	95% bias correlated bootstraps CI
-.97	-1.54	.49	.293	.143	-.1342 to .4721
-.97	0.00	-.43	.293	-.126*	.3729 to .0909
-.97	+1.54	-1.36	.293	-.397	-.7540 to .1002
0.00	-1.54	1.66	.293	.487*	.2059 to .8345
0.00	0.00	.74	.293	.217*	.0662 to .4104
0.00	+1.54	-.19	.293	-.053	-.2918 to .1786
+.97	-1.54	2.83	.293	.831*	.3837 to 1.3114
+.97	0.00	1.92	.293	.561*	.2461 to .9125
+.97	+1.54	.99	.293	.290*	.0051 to .6456

It can be concluded that the mechanism by which synchronised advertisements increase brand attitude while media multitasking through the increase in processing fluency, depends positively and linearly on the individual's privacy concern and negatively on their attraction towards the source of advertisement. It can be concluded that H14b is rejected as this assumption is valid only for people with average or higher privacy concern and with an average or lower level of source attractiveness. The positive effect of privacy concern and negative effect of source attractiveness tend to overlap each other's effects and do not create a more substantial combined effect on brand attitude.

5.7 Summary

The present study builds upon the previous study 2B and contributes to growing research of media multitasking by identifying the mechanism that helps in achieving the advertising objectives. In particular, the present study focuses on the cognitive ease in terms of processing fluency that needs to be achieved during media multitasking to help consumers remember advertisements. It establishes that synchronised advertisements during media multitasking result in better brand memory and its underlying mechanism is facilitated by processing fluency. The interaction of privacy concern and source attractiveness's interaction with the processing fluency is also tested.

In the previous study 2B, cognitive difficulty was identified as being detrimental to information processing while media multitasking. In this study, the role of cognitive ease when synchronised advertisements are seen on multiple devices while media multitasking is examined. Product placements in television shows were selected as a form of advertisement to test its effectiveness while media multitasking on television and smartphone. Synchronised advertising was manipulated by presenting mobile advertisements of a brand at the same time as the brand was shown on television. Processing fluency partially mediated the effect of synchronised advertising on brand memory and brand attitude. The study also found that people who receive synchronised advertising were concerned about their privacy, but it resulted in higher brand memory and higher attitude. In contrast, the attractiveness of brand endorsers in a television show reduced the processing fluency of people, which eventually had a negative effect on brand memory and brand attitude.

The impact of synchronised advertising on brand memory is strong and is partially mediated by processing fluency. The effect of synchronised advertising on brand attitude is also partially mediated by processing fluency. As processing fluency does not wholly mediates the effect, there might likely be other variables that can mediate the relationship between synchronised advertising and brand memory and brand attitude. Moderate to high privacy concerns moderate the mediation of processing fluency on the effect of synchronised advertising on brand memory and brand attitude. People are concerned with a breach of their privacy when they receive mobile advertisements synchronised with brands they see on television and this impacts their processing fluency. In fact, the higher privacy concern leads to better processing fluency of the advertisements and eventually better memory and attitude towards the advertised brand. Source attractiveness also moderates the mediation of processing fluency on the effect of synchronised advertising on brand memory and brand attitude. Source attractiveness has an inverse effect from privacy concern. People who find the television show participants attractive do not process the advertising message fluently, which results in their poor memory of advertisements and poor brand attitude. The privacy concern has a more substantial effect than source attractiveness, and thus, their combined effect is weaker than their individual effects on processing fluency. Source attractiveness diminishes the more substantial effect of privacy concern on processing fluency when both are tested together in a conditional model.

In future studies, different other factors or variables relevant to synchronised advertising which have a positive effect on advertising outcomes should be investigated. In this study, only processing fluency was tested as the mediator of the advertising effects of synchronised advertising. The processing fluency mediation model of synchronised advertising should also be tested for other advertising forms such as sponsorship in sporting events.. It would be interesting to compare the effect of synchronised advertising and related tasking on advertising outcomes while media multitasking. Is synchronised advertising which evokes privacy concern better than related tasking to achieve the advertising objectives while media multitasking? Due to the smaller sample size, regression analysis to test the interaction of privacy concern, source attractiveness and processing fluency could not be done, but in future studies, a three-way interaction with a significantly large sample size should be tested.

The next chapter discusses these topics in further detail by summarising the present thesis's contribution, its implications for management, and the direction it provides for further research to support academics and corporations trying to understand the role of media multitasking in advertising.

CHAPTER SIX: CONCLUSION

6.1 Overview

This final chapter addresses the key objectives of this research and reflects upon the main findings. A summary of the key contextual and methodological contributions to the theoretical understanding of media multitasking and its effect on advertising will be presented in this chapter. This research also provides a number of practical implications for advertisers, at the same time contributing to theory and literature. Some limitations of this study are also identified, which will help future researchers to refine and extend this research.

6.2 Addressing the Research Question and Research Objective: An Overview of the Findings

The present research was initially motivated by:

- The previous empirical findings in media multitasking literature, which suggested that using two or more media at once negatively affected the processing of information from the media as compared to consuming a single medium at a given time.

- Advertising research emphasised that the negative effect of media multitasking on the processing of information resulted mostly in challenges for the advertisers but also opportunities for better advertising effects in certain situations.

Based on the above-mentioned motivations and the gap in the extant literature, the main research question is:

When does media multitasking result in favourable advertising effects such as better memory and a better attitude towards the advertised brands, and what is the underlying reason for the positive advertising effect?

The majority of the media multitasking literature focusing on the advertising effects suggests its detrimental effect, such as poor brand memory and poor brand attitude. However, this study has identified reasons why and also when media multitasking is not detrimental for advertisers. Difficulty experienced during media multitasking is one of the important reasons for the detrimental effect of advertising. Specifically, it highlights that only the cognitive aspect of the difficulty results in the detrimental effect, whereas the physical aspect of the difficulty is not detrimental to advertising. The more cognitive difficulty experienced, the poorer is the advertising effects. When cognitive difficulty is reduced by creating a way of easing the processing of information during media multitasking, known as processing fluency, it results in positive effects for the advertising. To answer the main research question, the present study had a number of research objectives. Table 6.1 provides a summary of the research hypotheses that have been tested in order to answer the research question and address the individual research objectives.

The first objective of this research was to examine the effect of media multitasking on the cognitive and affective outcomes of advertisements and compare these outcomes on varied cognitive loads. Study 1 compared single-tasking with low and high media multitasking and found that as the cognitive load increased from single tasking to low and high media multitasking during media multitasking, the brand memory significantly reduced but there was no significant difference in brand attitude.

The second objective of this research was to understand the role of difficulty in media multitasking and its effect on the cognitive outcome (brand memory) of advertising. In a two-part study, Study 2 tested the role of difficulty by first measuring difficulty in the first part of the study and then manipulating difficulty (physical vs cognitive) in the second part to examine its effect on the cognitive outcome (brand memory) of advertising.

The third objective of this research was to test the underlying role of difficulty in the effect of synced advertising on cognitive (brand memory) and affective (brand attitude) outcomes during media multitasking. The difficulty was measured through processing fluency, which is the ease or difficulty with which information is processed. Thus Study 3 suggested that the cognitive ease of processing information partially mediates the effect of synchronised advertising on brand memory and brand attitude towards the synced advertisements. In addition, this effect is moderated by the physical attractiveness of the endorser of the advertisement and the privacy concerns of the subject towards synchronised advertisements.

***Table 6.1** Summary of the Supported and Non-Supported Research Hypotheses*

	Study No.	Hypothesis	Support
H1	1	Media multitasking negatively affects the memory of the ads as compared to single-tasking.	YES
H2	1	Media multitasking positively affects the attitude towards the brand as compared to single-tasking.	NO
H3	1	High cognitive load (heavy media multitasking) negatively affects the memory of the ads as compared to low cognitive load.	YES
H4	1	High cognitive load (heavy media multitasking) positively affects the attitude towards the brand as compared low cognitive load.	NO
H5	2	Media multitasking is perceived to be more difficult than watching a single screen.	YES
H6	2	Media Multitasking will be negatively related to advertising memory.	YES
H7	2	Difficulty mediates the effect of media multitasking on advertising memory.	YES
H8	2	Physically difficult media multitasking will have a positive effect on advertising memory.	YES
H9	2	The cognitive difficulty will have a negative effect on the memory of the brands shown on TV.	YES
H10	3	Synced advertising would result in positive (a) cognitive responses (brand memory) and (b) affective responses (brand attitude) than non-synced advertising.	(a)YES (b)NO
H11	3	People who receive synced ads will have better processing fluency and will, therefore, have (a) better memory and (b) better attitude of the advertised brands than the people who do not receive synced ads.	(a)YES (b)YES

H12	3	The mechanism via which the synced ads increases (a) brand memory and (b) brand attitude by increasing the processing fluency is based on the individual's privacy concern. Specifically, the effect of synced ads on the processing fluency is stronger for individuals with high privacy concern.	(a)YES (b)YES
H13	3	The mechanism via which synced ads increases the (a) brand memory and (b) brand attitude by increasing the processing fluency is based on the individual's perception of the attractiveness of the celebrity endorser. Specifically, the effect of synced ads on the processing fluency is weaker for individuals with a higher perception of endorser's attractiveness.	(a)YES (b)YES
H14	3	The mechanism via which synced ads increases the consumers' (a) brand memory and (b) brand attiude by increasing their processing fluency, is contingent upon the individuals' privacy concern. Specifically, the effect of synced ads cues on processig fluency is weaker for the individuals' with higher source attractiveness.	(a)NO (b)NO

6.3 Contribution to Theory

This research provided empirical results and conclusions that contribute to the growing literature on media multitasking, its effect on advertising and the underlying reasons for those effects. This research used the concept of different types of difficulty and processing fluency, which come from psychology literature, to explain how physical or cognitive difficulty or ease affect the processing of advertising messages. The next section describes the contextual and methodological contributions of this research to the media multitasking literature.

Contextual and Methodological Contributions

Earlier media multitasking research has suggested that, in comparison to single tasking, media multitasking leads to poor processing of information (Jeong and Hwang, 2016; Segijn and Eisend, 2019). Studies that focussed on the effects of media multitasking on the processing of advertising messages differed considerably in their results (Segijn and Eisend, 2019). The majority of the studies reported that media multitasking resulted in lower brand memory but there were a few studies that reported higher brand memory while media multitasking, such as Duff and Sar (2015), Angel et al. (2016) and Segijn et al. (2017). There was less conflict in the previous studies on the effect of media multitasking on brand attitude as most of the studies reported higher evaluation of brands (Jeong and Hwang, 2016; Segijn and Eisend, 2019). This research conducted the first study as a confirmatory study to validate the results observed in the literature. The first study used the theoretical models of capacity limitation as used in previous studies (Duff and Sar, 2015; Segijn et al., 2016), to test the effects on brand memory and brand attitude. The results of the first study confirmed the literature on the effect of media multitasking on brand memory but did not align with the effect on brand attitude. The participants in the study reported significantly lower brand memory during media multitasking but there was no significant difference in brand attitude between single taskers and media multitaskers.

The first study's important contribution to the literature is the comparison of cognitive load between media multitaskers, i.e. low media multitaskers and high media multitaskers, and its effect on advertising outcomes. There have been few studies that compared the effect of low media multitasking with high media multitasking (Ophir et al., 2009; Sanbonmatsu et al., 2013) and only one study by Duff et al. (2014) which compared low and high media multitasking in an advertising context. Duff et al. (2014) measured multitasking behaviour and media multitasking behaviour with subjective measures on a Likert scale. They measured the effect of advertising utility on the propensity to media multitask. In study 1, a more robust method and manipulated the cognitive load in an experimental setting to compare the effects of low media multitasking and heavy media multitasking on brand memory and brand attitude. The study revealed that low media multitaskers had better memory of the advertised brands processed while media multitasking than heavy media multitaskers. However, there was no difference in the attitude towards the brands processed while media multitasking between low media multitaskers and high media multitaskers. These results are partially consistent as brand memory expectedly decreased but brand attitude did not change between low media multitasking and high media multitasking as observed in the literature.

Another contribution of this thesis is to understand the effects of media multitasking in relation to structural interface and not capacity interface. Previous marketing and advertising studies that examined media multitasking focussed on the capacity interface, i.e. the limited capacity to process information while multitasking. Kahneman's (1973) capacity model of attention suggests that while media multitasking people are less able to process information from two different media because (1) two or more sources are competing for the limited cognitive resources; i.e. capacity interface and (2) two or more resources are competing for same sensory channels or resources i.e. structural interface (Jeong and Hwang, 2015). Previous media multitasking studies have focussed mainly on the first aspect, capacity interface (Voorveld, 2011; Duff and Sar, 2015; Segijn et al., 2016, Jeong and Hwang, 2016) and there has been limited research on the structural interface (Pool et al., 2000; Pool et al., 2003; Jeong and Hwang, 2015). Pool et al. (2000 and 2003) examined the effect of multitasking through the lens of the structural interface but focussed on homework performance or reading comprehension. Jeong and Hwang (2015) in their study tested the role of the structural interface on persuasive messages related to social issues presented in text format. In the second study of this research, a structural interface was tested during media multitasking and its impact on the processing of advertising messages presented on television. The structural interface was manipulated through physically difficult multitasking conditions and cognitively difficult multitasking conditions. The primary task was to process the advertising message presented during a football match telecast, while the secondary task involved using a smartphone for texting. Both the tasks involved cognitive resources to process messages from two different media. In the physically difficult multitasking condition there was less structural interface as the secondary activity involved more physical effort (using the subject's non-dominant hand) and did not compete for cognitive sensory channels or resources, whereas the cognitive difficult multitasking condition involved higher structural interface as media multitasking was performed after a high cognitive task (reading and marking activity), which depleted the cognitive resources of the participants and reduced the cognitive ability to multitask.

The results of the second study supported the structural interface assumption and aligned with the multiple resource theory suggested by Wickens (1984). The physical effort required in multitasking did not compete with the cognitive resources required for processing the advertising message. Wickens (1984) suggested that there will be no depletion in the performance of multiple tasks as long as the tasks draw resources from a different pool of resources. Participants in the physically difficult multitasking condition better processed the advertising messages as they reported higher brand memory than participants in the cognitively difficult media multitasking condition. This was due to the distinct resources required in their secondary tasks and minimising the structural interface. This study is the only study analysing the structural interface of media multitasking in the advertising context and thus makes an important contribution to the advertising media multitasking literature.

The second study of this dissertation also provided a methodological contribution to the existing literature. It applied Spencer et al.'s (2005) mediation process, which is considered better than Barron and Kenny's (1986) mediation process for examining psychological processes (Mostafa and Bottomley, 2020). An experimental-causal chain design was followed, where difficulty was measured in study 2A and then manipulated in study 2B as a predictor. It provided this study with a strong methodological base to establish the mediation of difficulty in the effect of media multitasking on advertising outcomes. No previous studies in media multitasking literature have employed an experimental-causal chain design to explain the mediation effect.

With the third study, this research significantly adds to the extant literature of media multitasking by testing the effectiveness of the relatively new and to date under-researched concept of synchronised advertising. This study provides a vital underlying reason for the effectiveness of synchronised advertising, i.e. processing fluency, which is the ease or difficulty with which people are able to process information from two different sources while media multitasking. This is the first study to explain the reason why synchronised advertising succeeds in achieving high brand memory and brand attitude. Previous research in marketing has suggested that processing fluency is pivotal in cross-media effects as people process the information more fluently when there are overlapping cues across different media (e.g. same colours, themes in advertisements across different media) (Voorvel and Valkunburg, 2015), however, it had not been investigated in the context of synchronised advertising or media multitasking. The third study addressed this gap and found that synchronised advertising allows people to process information more fluently (easily) across two different media (sources), while media multitasking and results in better memory and a slightly better attitude towards the advertisement.

In addition to the positive effect of synchronised advertising on brand memory and brand attitude through higher processing fluency, this effect is dependent on people's privacy concerns and their perception of the attractiveness of endorsers of the brands. Viewers with moderately higher privacy concerns towards synchronised advertising had higher processing fluency which resulted in their better memory and attitude towards the brands. People with moderate and high concern for their privacy as regards using the media process the information of the advertising message more fluently and thus have better memory and better attitude towards the advertised brand. However, when people find the endorsers in the advertisements attractive their processing fluency decreases. This results in low brand memory and low brand attitude when people's perception of the endorser's attractiveness is moderately low. When people receive synchronised advertising their processing fluency decreases as their admiration of the attractiveness of endorsers increases. This eventually results in lower memory and lower positive attitude towards the brands. These results are highly valuable for media multitasking literature as synchronised advertising is a new concept and there are vast opportunities for research into this concept. The results of this study provide important dimensions to this new concept.

This research tested the effects of media multitasking on different types of advertising messages as opposed to a single type of advertising message. For example, in the first study, television commercials were used as stimuli to measure the effect of media multitasking on brand memory and brand attitude. In the second study, the effectiveness of football match sponsors in terms of their memory during media multitasking was tested. The sponsorship effectiveness on perimeter boards and players' jerseys was tested, whereas in the third study, brand placement in television shows and mobile advertisements while browsing social media were tested. People were likely to avoid advertising while watching television and would skip advertisements if watching pre-recorded material or switch attention, or block the advertisements altogether (comScore, 2018). OTT (over the top) media consumption such as Netflix, Amazon Prime and BBC iPlayer, do not include television commercials, and consumption of this content is set to increase. Thus, there is a growing need to investigate the effectiveness of subtle advertising such as brand placements, sponsorships and synchronised advertising which is well suited to OTT media (Swan, 2020). This research has provided results that measured the effectiveness of advertising that is relevant to present consumer behaviour, which has perceived subtle advertising less negatively than television commercials (Yoon et al., 2011).

Another contribution of this research has been the use of a wide sample. Through the course of three experiments in this research, the data has been collected in three different cities in two different countries. The first experiment primarily focussed on a University student sample, and the data was collected in the Plymouth, United Kingdom. In the second experiment, to measure the effectiveness of European Football sponsors, the data was collected in Delhi, India to control for the bias of familiarity of European brands in India. For the third experiment, the data was collected in two different cities of the United Kingdom, London and Plymouth. Taking a sample from two different cities helped in gaining a valid impression of the United Kingdom's consumer behaviour and its implication in advertising processing.

6.4 Implications for Practice

One of the primary objectives of advertising is to successfully expose the message and gain the attention of the audience (Barry, 1987). In the current digital age, when the majority of people are consuming content from more than one media at a given time (Nielsen, 2018), drawing attention to advertising messages gets difficult. Media multitasking is a common behaviour with individuals media multitask almost 50% of the time they are consuming any media (Voorveld et al.; 2014). The change in the media consumption behaviour of people calls for a need to re-evaluate the ways in which advertisements are placed within those media. Media multitasking divides the attention resources, which are essential for the successful processing of advertising messages. This creates opportunities as well as challenges for marketers and advertisers. They, therefore, need to capitalise on the opportunities and overcome the challenges posed by changing media consumption behaviour.

This study provides some help to marketers and advertisers by identifying the situations when media multitasking can be beneficial for advertising effects as well as situations that should be avoided because of the detrimental effects of advertising. Through the results from the first study, advertisers can learn that placing advertisements in media that are more likely to be consumed with other media should be avoided. As the cognitive load of the consumer increases with increased media multitasking, the consumer will remember fewer advertised brands compared to when she/he is not media multitasking. The advertisers of brands that want to create a strong impact on the memory of consumers should rather place ads on media that are not consumed while multitasking. For instance, placing ads on a smartphone or during the telecast on TV when the consumer is only watching a particular media. Although media multitasking is detrimental to the memory of the advertised brands, it does not affect the attitude towards the brands. Advertisers who are therefore less concerned about the memory of the brands and more concerned about the attitude towards them should take the opportunity to place their advertisements when consumers are media multitasking. There is no negative effect of media multitasking on the evaluation of the brands while media multitasking. As per the results of the first study, the increased cognitive load of media multitasking does not affect the evaluation of the advertised brand. Thus, the brands that already have a positive attitude in the minds of the consumers are best placed to advertise on media which are likely to be involved in media multitasking as it would not have any negative impact on their evaluation.

Media multitasking involves a combination of tasks that involve cognitive as well as physical effort. Younger individuals, aged less than 35, on average, perform more than two tasks while watching television (Deloitte, 2015). Among those three tasks, these young individuals would likely be performing a non-media task while media multitasking, for example, watching television, using a smartphone and eating breakfast. Marketers who have younger individuals as their target market should be wary of the fact that individuals will be burdened with physical as well as cognitive effort while processing advertising messages on one of the media, as it has been observed in previous literature and also confirmed in this research that cognitive load has a negative effect on the memory of the advertised brands. However, if the marketers place advertisements when the individuals are involved in multitasking that involves physical rather than cognitive effort, their memory of the advertised brand would be better. There is an increasing trend of watching comfort television shows, which are usually watched by the viewer previously and are watched again in order to feel good (Nicolaou, 2020). People watch comfort shows to have a low-level distraction while they are busy doing other tasks such as house chores (Godwin, 2019). People like to watch the re-runs of their favourite shows on television while they are doing tasks requiring more physical effort. Re-runs of famous American sit-com *Friends* on Comedy Central and regular telecast of Only *Fools and Horses* on Gold channel are very popular in the United Kingdom and are classic examples of comfort television (Sayid, 2020; Godwin, 2019). Friends originally aired between 1994-2004, while Only Fools and Horses aired in the UK between the 1980s and 1990s but are still watched for comfort and mild distraction from tedious work (Godwin, 2019). This type of media multitasking increases the physical effort of an individual but does not impact the processing power of advertising messages presented while multitasking. Thus, marketers should try and place their advertisements during the re-runs of these comfort television shows as they are most likely consumed when viewers are busy with tasks involving more physical effort.

Modern media consumption behaviour involving media multitasking provides another important opportunity for marketers to use synchronised advertising. The placement of advertisements of the same brand on two different devices simultaneously, known as synchronised advertising, creates a powerful impact on the viewers' memories and attitudes towards the brand. Marketers have an immense amount of data available to them about their target audience. The data about their interests on the content they are consuming on television in real-time would help them to surgically target the same advertisements they are watching on television on their mobile devices (smartphone/tablet) at the same time. Synchronised advertising would help them create a better memory of the brand and a favourable attitude towards the brand. The synced advertising effect is more pronounced for individuals who have moderate to high privacy concerns about their data usage. This is because privacy concerned individuals are better able to assess the breach of their privacy by the synchronisation of ads. It then leads to better identification and eventually better processing of the ads. However, this negative valence of ad synchronisation has a positive effect on both brand memory and brand attitude. This is an interesting implication for the marketers as the results of this study show people do not mind if their privacy is being breached; people are concerned about their online privacy and remember the synchronised ads as it contravents their privacy. Brands that are looking to impact a strong recall and recognition of their brands should pursue synchronised ads irrespective of being ethically judged for breaching consumers' privacy.

Although synchronised advertising is very powerful, its effect gets diluted by the physical attractiveness of endorsers of the advertising message. Marketers should not place synchronised advertising using highly attractive endorsers as it condenses the effect of the synchronised advertising. This study is the first study to provide marketers and advertisers with factors that would help them increase the effect of synchronised advertising.

In conclusion, it is important for marketers and advertisers to adapt their strategy to the media multitasking behaviour of the consumers. The present research highlighted some opportunities which should be tapped in order to maximise advertising effectiveness upon media multitasking consumers. It will help marketers design an appropriate communication mix and strategy which is suited to the media multitasking behaviour of their target market. To this end, the present study also contributes valuable insights for digital marketers on gathering consumers' media consumption data and how it can be used as an opportunity to better place target advertisements. This study also faced some limitations which may provide learning opportunities for future research, which are discussed in the next section.

6.5 Research Limitations and Future Research

The present study focussed on exploring the effect of media multitasking on advertising effectiveness and the role of difficulty and ease in processing this effect. A significant factor that impacts the processing of information while media multitasking is emotion, which has historically been overlooked. Hence, future studies should explore the role of positive as well as negative emotions in information processing during media multitasking.

All the studies in this research adopted a cognitive approach in empirically and quantitatively testing media multitasking effects using laboratory experiments. Application of new and innovative technologies such as eye-tracking and functional magnetic resonance imaging (fMRI) could have been used to collect rich data on information processing while media multitasking.

This research only focussed on the cognitive and attitudinal outcomes of advertising, i.e. brand memory and brand attitude. The ultimate goal of any advertising is to result in the sale of a product. This research did not assess the effect of media multitasking on purchase behaviour. Future research on media multitasking should therefore focus on the behavioural outcome of advertising, such as purchase intentions.

A major limitation of this research is found in the practical implication of the second study. As per the results of the second study, an increase in physical effort does not impact the advertising effectiveness negatively while media multitasking. In the real world, there are only a few situations where media multitasking involves two media either involving or in addition to a task involving physical effort. Further, it is difficult to imagine when the two media are screen-based and require more resources (audio as well as visual) in addition to a task being performed that requires physical effort. The results of the second study are not generalised to the majority of the population outside gymnasiums or to a situation when media multitasking involves at least one physically difficult task. Thus, future studies should focus on media multitask combinations that are more common among the wider population.

The use of experimental design in the laboratory setting to simulate the real-life experience raises the issue of generalisation to real life. Heather (1976) argues that people behave differently in laboratory settings when compared to real life. Thus, laboratory experiments provide unnatural behaviour that is not best suited for real-life implications and this is a major limitation of laboratory-based experiments. However, to test hypothesised effects such as in this research it was necessary to test it in a laboratory as it helps in controlling for the effect of all other factors which could have been problematic in a field experiment.

A methodological limitation of this research has been in measuring the brand memory in all three experiments. The memory of the advertised stimuli brands was calculated by the free recall, aided recall and recognition. This research has used the brand memory scales used by the leading researchers of media multitasking such as Angell et al. (2016) and Segijn et al. (2019). For each right answer, a positive score was provided, but there was no negative scoring for wrong answers. Lucky guesses on recognition memory might have amplified the total memory scores. In future studies, it should be necessary to control the lucky guesses for a fair evaluation of memory of the stimuli by improvising the brand memory scales.

Finally, there was a limitation with the stimuli used in the third study. The stimuli are shown on the smartphone to simulate synchronised ads and non-synchronised ads differed in their modality. The synced ad brands (Range Rover and Rewired) had a combination of the logo/picture and text, whereas the non-synced ad brands (Gazprom and FedEx) only had the logo. Boerman et al. (2017), in their eye-tracking study, provide evidence that brand placement with a combination of logo and text is more effective for recognition memory than just placement of a logo. However, all the brands in either synced or non-synced ads had a wordmark logo, i.e text-based logo which spells out the name of the brand. In future studies, the stimuli between synced and non-synced conditions should not differ in any context for better evaluation of the effect of synced ads. In the next section, future direction of research in media multitasking is suggested on the basis of the limitations identified above.

First, to ensure the application of the results of my study, future research should focus on the direct and indirect effect of media multitasking on advertising effectiveness using a non-student/university sample. In the third study, the brand memory and brand attitude towards Range Rover were measured which is not the most suitable brand for the student sample. Future research should focus on alternative product categories that are more suited to the target sample. These future research projects could also explore whether the advertising of different product categories is processed differently between genders and different age demographics.

Secondly, future research should try to explain the effects of media multitasking from an alternative theoretical stance than the limited capacity models, such as those given by Lang (2000) and Kahneman (1973). The limited capacity models satisfactorily explain the reasons for the inferior processing of messages while media multitasking as opposed to single-tasking, due to the overload of demand and the limited availability of resources required for processing. However, there is not enough evidence supplied from media multitasking research to explain the reasons for putting the resources in such overload conditions. Future research should examine the gratification achieved from media multitasking and how it affects advertising outcomes. Although the two parts of Study 2 tried to explain the media multitasking effects through different theoretical underpinnings rather than through a limited capacity model, it still focussed on the utilitarian outcomes relevant to marketers. Researchers should look for theories that explain multitasking from a perspective different than that of cognitive resources. For instance, focus on the physical ability to perform multiple tasks for efficient utilisation of cognitive resources.

Thirdly, the media multitasking research is dominated by quantitative research techniques such as surveys and controlled experiments. The development of new technologies such as eye-tracking devices and fMRI has been extremely beneficial in understanding human behaviour. Academics interested in consumer behaviour and processing of advertising information should employ these new techniques to elaborate upon the understanding of consumer behaviour.

Finally, the application of synchronised advertising should not be generalised based on the few studies that have been conducted. Synchronised advertising is an evolving concept and consumers are largely unaware of it and do not know how it operates. As was observed from the third study, privacy concerns had an indirect positive impact on advertising outcomes. However, when people are aware of the data using techniques used in synchronised advertising, they may have a negative attitude towards it, as has been observed with other behavioural advertising methods that used consumer data which are considered "creepy" and a violation of their privacy (Segijn and Voorveld, 2020; Smit et al., 2014). Future research should look into synchronised advertising from the attitude and perspective of consumers towards the ethical implications of advertising. For instance, the privacy concern and attitude towards personalised ads during synced advertising should be explored.

6.6 Summary of Final Thoughts

This final chapter of thesis has reviewed the impact of the research and its empirical findings by:

1. Addressing the research questions and the motivation behind them
2. Reflecting on the contribution of this research to media multitasking literature, through the role of difficulty, processing fluency, and, most importantly, synchronised advertising.
3. Directing the marketers and advertisers who would like to understand the implications of media multitasking behaviour and to create advertisements that have a positive and effective desired impact on the target audience.

I would know like to conclude by stating that this research has been further motivated by an interest in advertising which is a major industry in the United Kingdom with one of the highest levels of expenditure in the world (Guttmann, 2020). The advertising industry is increasingly digitalised with more than half of advertising expenditure in a digital form, such as social media advertising, search engine websites and data-driven advertising (Guttmann 2020a). This research has developed an understanding of the media consumption behaviour of people and how it affects their processing of content through different media. The empirical findings of this research suggest that media multitasking is not a bad omen for advertisers but an opportunity for new robust communication strategies. Previous studies have identified certain circumstances and situations where media multitasking is favourable for advertisers. This research contributes further by identifying further circumstances when advertising can have a positive effect. People are now consuming more content than ever on different media devices which gives more opportunity for advertisers to reach their target audiences. Media multitasking is the new normal for media consumption, thus it is expected that advertisers will adapt and create advertising relevant to the new normal. The biggest lesson learned from this research is that processing fluency, or ease, is an important factor in creating effective advertising as it facilitates the processing of messages from different sources. These findings and the detailed review of past literature has expanded knowledge of how people process information from two or more sources at the same time and how it can benefit the advertisers.

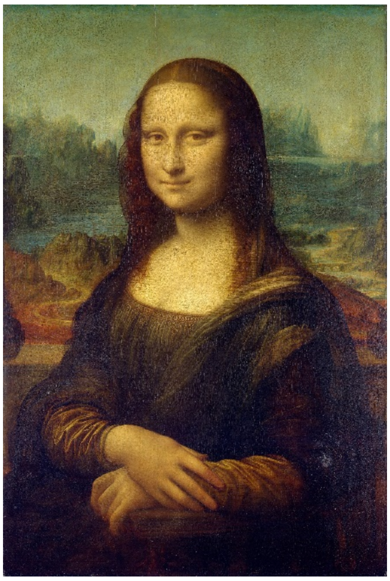
Appendix A: Study 1 Quiz Questions

Q1.

If you are attending a concert or a football match at Wembley Stadium, which city are you in?

Q2. Ibiza is an Island off the east coast of Spain, it is in which sea?

Q3.



The Mona Lisa, a portrait painting by the famous artist Leonardo da Vinci is on permanent display at which museum?

Q4. This country's wildlife resources are described as "without parallel in Africa". It also has the famous Lake Victoria and the Mt. Kilimanjaro, highest mountain in the continent.

Q5.

Which city is also called the Lion City and has one of the two Universal Studios in Asia?

Q6.

The Great Pyramid of Gaza is found in which country?

Q7. Which of the following countries does not use the Euro as its currency?

Q8. 

Oktoberfest is the world's largest beer festival. It is held in which city?

Q9. 

Which Caribbean country has the world's biggest uninterrupted waterfall (Angel Falls) and also has the worlds largest oil reserve?

Q10. If I am planning to visit The Great Barrier Reef, Bondi Beach and the Blue Mountains, which country am I interested?

Q11. 

Petra is one of the new seven wonders of the world. To which country would you have to go to see this beautiful architecture?

Q12. Which city is best known for its kebab and the Grand Bazaar? (It is also the biggest city in Europe)

Q13. 

Bollywood, also known as Hindi Cinema is based in which of the Indian city?

Q14. 

People suffering from vertigo should not visit Zhangjiajie Glass Bridge. In which country will you find this bridge?

Q15. 

Which is the only country you can go to see the professional Sumo Wrestling?*

Appendix B: Study 1 Questionnaire

Thank you for watching the video clip. Please answer the following questions

If you find any problem in answering a question please ask the researcher

Vacation Experience

Q. Where did you last take a holiday or vacation?

____

Q. Please rate your last holiday/vacation on the following traits. Kindly mark on the point that best describes your satisfaction towards the experience.

Displeasing	Pleasing
Dissatisfy	Satisfy
Negative	Positive
Unfavourable	Favourable

Q1. From the video you just saw, which advertisement products can you recall?

Kindly write the product names in the section below. For example Car is a product and BMW is the brand.

Q2. From the video you just saw, which advertisement brands can you recall?

Kindly write the brand names in the section below. For example Car is a product and BMW is the brand.

Q3. Can you recall the brands of the advertisements that you saw in the video from the following products?

Product	Brand
Liquid Detergent	
Crisps/Snacks	
Banking	
Airline	
Deodorant	

Q4a. Please rate Gulf Bank on the following traits. Kindly mark on the point that best describes your attitude towards Gulf Bank

Bad	Good
Unappealing	Appealing
Unattractive	Attractive

Q4b. Please rate Rexona on the following traits. Kindly mark on the point that best describes your attitude towards Rexona.

Bad	Good
Unappealing	Appealing
Unattractive	Attractive

Q4c. Please rate Downy on the following traits. Kindly mark on the point that best describes your attitude towards Downy.

Bad	Good
Unappealing	Appealing
Unattractive	Attractive

Q4d. Please rate TigerAir on the following traits. Kindly mark on the point that best describes your attitude towards TigerAir.

Bad	Good
Unappealing	Appealing

Unattractive	Attractive

Q4e. Please rate SnackJack on the following traits. Kindly mark on the point that best describes your attitude towards SnackJack.

Bad	Good
Unappealing	Appealing
Unattractive	Attractive

Q5. How much attention did you pay on each device?

1 being not at all and 7 being highly attentive.

a. Laptop

1	2	3	4	5	6	7

b. TV

1	2	3	4	5	6	7

Q6. How difficult was the task for you?

1 being not at all and 7 being highly difficult

1	2	3	4	5	6	7

Q7. Age _____ years

Q8. Gender

Male　　　　Female

Q9. Education Qualification (Mark adjacent to your level of education)

High School

Senior Secondary

Bachelors

Masters

PhD

None

Appendix C

Data Analysis of Study 1

1. One way ANOVA for Manipulation Check – Attention and Difficulty

Descriptives

			N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum	Between- Component Variance
Attention: How much attention did you to the Main Screen	1		35	5.1714	1.29446	.21880	4.7268	5.6161	3.00	7.00	
	2		35	4.2857	1.52569	.25789	3.7616	4.8098	1.00	7.00	
	3		35	3.8571	1.68283	.28445	3.2791	4.4352	1.00	7.00	
	Total		105	4.4381	1.59280	.15544	4.1299	4.7463	1.00	7.00	
	Model	Fixed Effects			1.50945	.14731	4.1459	4.7303			
		Random Effects				.38698	2.7731	6.1031			.38415
Difficult: How difficult was the activity	1		35	3.4286	1.59569	.26972	2.8804	3.9767	1.00	7.00	
	2		35	4.3429	1.62595	.27483	3.7843	4.9014	1.00	7.00	
	3		35	5.4571	1.44187	.24372	4.9618	5.9524	2.00	7.00	
	Total		105	4.4095	1.75244	.17102	4.0704	4.7487	1.00	7.00	
	Model	Fixed Effects			1.55659	.15191	4.1082	4.7108			

	Random Effects				.58655	1.8858	6.9332			.96288

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Attention: How much attention did you to the Main Screen	Based on Mean	1.024	2	102	.363
	Based on Median	.647	2	102	.526
	Based on Median and with adjusted df	.647	2	84.723	.526
	Based on trimmed mean	1.001	2	102	.371
Difficult: How difficult was the activity	Based on Mean	.311	2	102	.733
	Based on Median	.270	2	102	.764
	Based on Median and with adjusted df	.270	2	101.839	.764
	Based on trimmed mean	.355	2	102	.702

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Attention: How much attention did you to the Main Screen	Between Groups	31.448	2	15.724	6.901	.002
	Within Groups	232.400	102	2.278		
	Total	263.848	104			
Difficult: How difficult was the activity	Between Groups	72.248	2	36.124	14.909	.000
	Within Groups	247.143	102	2.423		

		Sum of Squares	df			
	Total	319.390	104			

Multiple Comparisons

Tukey HSD

Dependent Variable	(I) Condi	(J) Condi	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Attention: How much attention did you to the Main Screen	1	2	.88571*	.36083	.041	.0275	1.7439
		3	1.31429*	.36083	.001	.4561	2.1725
	2	1	-.88571*	.36083	.041	-1.7439	-.0275
		3	.42857	.36083	.463	-.4296	1.2868
	3	1	-1.31429*	.36083	.001	-2.1725	-.4561
		2	-.42857	.36083	.463	-1.2868	.4296
Difficult: How difficult was the activity	1	2	-.91429*	.37210	.041	-1.7993	-.0293
		3	-2.02857*	.37210	.000	-2.9136	-1.1436
	2	1	.91429*	.37210	.041	.0293	1.7993
		3	-1.11429*	.37210	.010	-1.9993	-.2293
	3	1	2.02857*	.37210	.000	1.1436	2.9136
		2	1.11429*	.37210	.010	.2293	1.9993

*. The mean difference is significant at the 0.05 level.

2. One-Way ANOVA comparing Brand Memory Single-tasking, Low media multitasking and High Media Multitasking

Descriptives

Brand Memory

		N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Between-Component Variance
						Lower Bound	Upper Bound			
1		35	14.0000	6.78667	1.14716	11.6687	16.3313	1.00	27.00	
2		35	10.6286	5.47231	.92499	8.7488	12.5084	3.00	26.00	
3		35	7.4571	4.71757	.79741	5.8366	9.0777	1.00	23.00	
Total		105	10.6952	6.27131	.61202	9.4816	11.9089	1.00	27.00	
Model	Fixed Effects			5.72307	.55851	9.5874	11.8030			
	Random Effects				1.88905	2.5673	18.8232			9.76976

Test of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Brand Memory	Based on Mean	2.208	2	102	.115
	Based on Median	2.067	2	102	.132
	Based on Median and with adjusted df	2.067	2	99.692	.132
	Based on trimmed mean	2.357	2	102	.100

ANOVA

Brand Memory

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	749.390	2	374.695	11.440	.000
Within Groups	3340.857	102	32.754		
Total	4090.248	104			

Robust Tests of Equality of Means

Brand Memory

	Statistic[a]	df1	df2	Sig.
Welch	11.275	2	66.653	.000
Brown-Forsythe	11.440	2	93.432	.000

a. Asymptotically F distributed.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Brand Memory

Tukey HSD

					95% Confidence Interval	
(I) Condi	(J) Condi	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1	2	3.37143*	1.36807	.040	.1176	6.6253

	3	6.54286*	1.36807	.000	3.2890	9.7967
2	1	-3.37143*	1.36807	.040	-6.6253	-.1176
	3	3.17143	1.36807	.058	-.0824	6.4253
3	1	-6.54286*	1.36807	.000	-9.7967	-3.2890
	2	-3.17143	1.36807	.058	-6.4253	.0824

*. The mean difference is significant at the 0.05 level.

Appendix D: Stimuli for Cognitive Load

Instructions

Your task is to cross off all instances of the letter “e” in the sheet provided to you by implying the following rules.

Rule 1: You can only cross off an “e” if it is **not adjacent** to another vowel (a, e, i, o and u). For example you can cross of the letter “e” in the word SCENT, but you cannot cross off the letter “e” in the word MEANT.

Rule 2: You **cannot cross off** the letter “e” if it is **another letter away** from another vowel. For example you cannot cross off the letter “e” in the word FRAME as it is just one letter away from another vowel.

The rules of adjacent letter and one letter away are only applicable to a particular word and not to the next word. For example you can cross of the letter “e” in the word SHE and as well as the letter “e” in the next word EGG as they are two different words.

If you have any further questions please feel free to ask the researcher.

Best of luck!

ported by many authors that a Log-Normal distribution is a suitable probability density function to characterize drop sizes in a spray (see Schmehl et al. (1999), Samenfink et al. (1999), Wu (2003) and Babinsky and Sojka (2002) for a review).

Finite mixture distributions appear in a natural way when the mean of a variable "looks" different among observed data. This informal indicator of heterogeneity suggests the use of statistical models involving discrete latent variables such as clustering or latent class models. Finite mixture distributions arise as marginal distributions of such models. These statistical models can also capture many specific properties of real data such as multimodality, skewness, kurtosis and unobserved heterogeneities.

An imediate consequence of our main assumption is that the distribution of the logarithm of the drop size is a mixture of Normal distributions. Suppose that a data set $\mathbf{y} = (y_1, \ldots, y_N)$ is available, which consists of N independent and identically distributed observations of a random variable distributed according to a mixture of fixed K normal distributions:

$$f_{mix}(y_i) = \sum_{k=1}^{K} \eta_k f_N(y_i|\mu_k, \sigma_k^2). \tag{1}$$

In this setting, we are concerned with the estimation of the component parameters $\boldsymbol{\mu} = (\mu_1, \ldots, \mu_K), \boldsymbol{\sigma}^2 = (\sigma_1^2, \ldots, \sigma_K^2)$ and the weight distribution $\boldsymbol{\eta} = (\eta_1, \ldots, \eta_K)$ of the underlying mixture distribution, based on the data $\mathbf{y}$.

Without going deeper into this comparison, but only for the sake of not restricting our approach of finding the best finite mixture to a single one, a preliminary analysis has been made, where two independent, but similar approaches, are employed: a classical Maximum Likelihood (ML, see Appendix A for further details) estimation based on the expectation–maximization (EM) algorithm and a Bayesian approach based on a Markov chain Monte Carlo algorithm (MCMC, see Appendix B for further details) as described in Frühwirth-Schnatter (2006).

Each approach is generated by a two-step iterative procedure based on the complete-data likelihood function $p(\mathbf{y}, \mathbf{S}|\boldsymbol{\mu}, \boldsymbol{\sigma}^2, \boldsymbol{\eta})$ given by

$$\log p(\mathbf{y}, \mathbf{S}|\boldsymbol{\mu}, \boldsymbol{\sigma}^2, \boldsymbol{\eta}) = \sum_{i=1}^{N}\sum_{k=1}^{K} \delta_{ik} \log\left(\eta_k f_N(y_i|\mu_k, \sigma_k^2)\right), \tag{2}$$

where $\mathbf{S} = (S_1, \ldots, S_N)$ are considered to be allocations of each data point to its corresponding component in the mixture and δ_{ik} is a 0/1 coding of this allocation, S_i: $\delta_{ik} = 1$, if and only if $S_i = k$ (i.e. if the observable y_i comes from component k of the mixture). The allocations $\mathbf{S} = (S_1, \ldots, S_N)$ are regarded as data without a value stored in the current observation, i.e. missing data or (unobserved) latent variables.

Although both approaches are of interest and they show similar results when applied to our data, the main difference of the Bayesian approach, from the ML approach, is the inclusion of a proper prior distribution on the component parameter, which has a smoothing effect on the mixture likelihood function and reduces the risk of obtaining spurious modes in cases where the EM algorithm leads to degenerate solutions, thus supporting our choice for the Bayesian approach.

2.1. Fitting a finite mixture model

The decision of fitting a mixture model is due to the apparent multimodality of the empirical distribution of drop size data, which is possibly caused by multiple atomization mechanisms in the spray. Even if we assume a fixed family of mixture distributions like Log-Normal, we are still faced with the problem of model specification, i.e. of finding the true number of components in the mixture K. Here, an attempt is made to fit a univariate finite mixture model with $K \in \{1, \ldots, 10\}$ normal components to the log(d) data, where d represents the diameter of a droplet.

One can use informal methods for identifying the number of components like mode hunting in the graphical representation of posterior draws or like comparing the moments of different models. Also one can use methods based on the likelihood function and some point estimators for the model parameters like Akaike Information Criterion (AIC) or similar criterions that favor the goodness-of-fit instead of model complexity. Moreover, one can use a Bayesian approach like trans-dimensional MCMC which allows jumps at each step of the chain from one model to another or like computing the marginal posterior density $p(\mathcal{M}_K|y)$. Following Frühwirth-Schnatter (2006), we primarily use this second Bayesian approach. More precisely, if we assume equal priors on the models and apply the Bayes' rule to quantify posterior evidence in favor of each model, this evidence is given in terms of marginal likelihoods of the data by:

$$p(\mathcal{M}_K|y) \propto p(y|\mathcal{M}_K)p(\mathcal{M}_K)$$

and the marginal likelihood $p(y|\mathcal{M}_K)$ is given by an integration of the likelihood function over all possible parameters. From hereafter, we will use the estimate for the marginal likelihood $p(y|\mathcal{M}_K)$ as a prime classifier for the mixture models. All subsequent implementations were carried out using the package *bayesf* Version 2.0 developed in Matlab (Frühwirth-Schnatter, 2006).

2.2. Application of finite Log-Normal mixture to a simulated spray

In order to validate the Bayesian approach we first test the method on simulated data sets generated from mixtures of three Log-Normal distributions. To simulate a typical spray scenario, we chose the following parameters: $\boldsymbol{\mu} = (\ln(20), \ln(50), \ln(80)) = (2.996, 3.912, 4.382)$, $\boldsymbol{\sigma} = \left(0.7/\sqrt{6}, 1.7/\sqrt{6}, 1/\sqrt{6}\right)$ (see Wu, 2003; Panão and Moreira, 2008) and three different cases of weights: $\boldsymbol{\eta} = (1/3, 1/3, 1/3)$, $\boldsymbol{\eta} = (0.1, 0.2, 0.7)$ and $\boldsymbol{\eta} = (0.1, 0.5, 0.4)$.

Moreover, instead of estimating just one model for each $K \in \{1, \ldots, 10\}$ and then select the finite mixture model that has the largest marginal likelihood, five finite mixture models are simulated for each K and then the one with the largest marginal likelihood is selected. This approach is used to further test the method and it is grounded in our experience with real data, namely for some K's the estimated finite mixture models can fit into two or more classes of models that exhibit some difference between their marginal likelihoods. This phenomenon is probably due to the fact that the method sometimes is struggling with births and deaths of components in the mixture.

Fig. 1 presents the fitted models for the three synthetic data sets and a positive match is observed between these fitted models and the real models. All fitted models find the actual number of components and give good estimates for the means and variances (μ_k, σ_k) and fair estimates for the weights (η_k). Each plot includes a table with the percentual deviations obtained between the imposed values and those obtained by the Bayesian approach with a MCMC algorithm. The approach is shown to be very robust in accurately capturing the characteristic value of μ (deviations < 1%), and to a certain point also the σ values. However, relatively to the weights, moderatly deviations are observer, although within a reasonable degree of accuracy (of the order of 10%), evidencing a higher sensitivity of the approach in the estimation of η.

At this point it should be emphasized that this unsupervised Bayesian learning can be seen as a clustering method, and even if the underlying Log-Normal distributions are not the real ones or if the fitted model is underfitting or overfitting, the estimates of the parameters can still give us a good idea of the composition,

Appendix E: Study 2A and 2B Questionnaire

Thank you for watching the video clip. Please answer the following questions

If you find any problem in answering a question please ask the researcher

Q1. How often do you watch Football? Mark you response on the scale from 1 to 7.

1 Being not at all and 7 being all the time

1	**2**	**3**	**4**	**5**	**6**	**7**

Q2. How many matches of the last season's Europa League did you follow? Mark you response on the scale from 1 to 7.

1 Not a single one and 7 All the matches

1	**2**	**3**	**4**	**5**	**6**	**7**

Q3. Did you watch the quarter-final second leg match between Ligue 1 side Marseille and the German side Leipzig?

Yes **No**

Q4. On a scale from 1 to 7. How much do you follow the following teams?

A. Olympique de Marseille
1 Being not at all and 7 being all the time

1	**2**	**3**	**4**	**5**	**6**	**7**

B. RB Leipzig
1 Being not at all and 7 being all the time

1	**2**	**3**	**4**	**5**	**6**	**7**

Q6. From the match highlights you just saw, which advertisers did you see on the perimeter boards around the playing area?

For example in this picture ODEAN is a perimeter board advertisement.

How many perimeter sponsors do you recall?

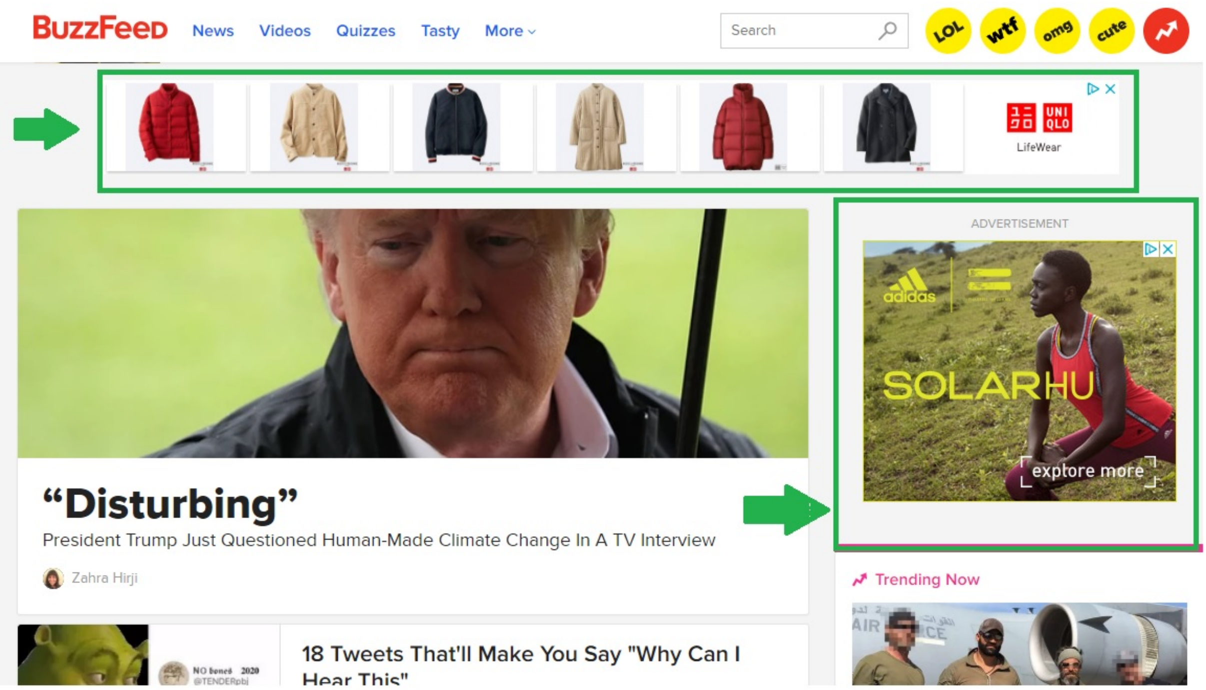
Q7. From the match highlights you just saw, do you recall the shirt sponsors of both the teams?

For example in this picture AIA is the shirt sponsor of the team.

A. Olympique de Marseille's Shirt Sponsor ………………………………………..
B. RB Leipzig's Shirt Sponsor- ………………………………………..

Q8. Do you recall any banner advertisement on the mobile phone while you were taking the quiz?

For example in this picture UNIQLO and ADIDAS are the banner advertisements.



Can you name the banner advertiser on the mobile while you were taking the quiz?

Q9. Did you see any of the following brands on perimeter boards during the match?

Please select the brands you remember from the match.

1629 TYSKIE	DHL	L'ORIGINAL Panach' DEPUIS 1976 PANACHADE
FedEx	Deutsche Bank	MICHELI
evian	EST. 1873 Heineken	Herme Makes delivery ea
Santander	UniCredi	TOYOTA

Q10. Did you see any of the following brands as shirt sponsors for any of the teams?

Please select the brands you recognise from the match as shirt sponsors.

MONSTER ENERGY	vivendi
Emirates	orange
Red Bull	SIXT rent a car

Q11. Did you see any of the following as banner advertisement on the mobile while you were taking the quiz?

Please select the brands you recognise from quiz.

SHARP	KFC	KIA KIA MOTORS

Q12. How much attention did you pay on each device?

1 being not at all and 7 being highly attentive.

c. TV Attention

1	**2**	**3**	**4**	**5**	**6**	**7**

d. Mobile Attention

1	**2**	**3**	**4**	**5**	**6**	**7**

Q13. How difficult was the task?

1 being not at all and 7 being highly difficult

1	**2**	**3**	**4**	**5**	**6**	**7**

Q14. Have you travelled to Europe or UK in the past 3 years?

Yes	**No**

Q15. Age _____ years

Q16. Gender

Male	**Female**

Q17. Education Qualification (Mark adjacent to your level of education)

High School	
Senior Secondary	
Bachelors	
Masters	
PhD	
None	

Q18. How proficient are you in English? Mark you response on the scale from 1 to 7.

1 being not at all and 7 being highly

1	**2**	**3**	**4**	**5**	**6**	**7**

Appendix F: Data Analysis Study 2A and 2B

1. Independent T-test comparinf Single Tasking and Media Multitasking

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Dif_Eff	Equal variances assumed	3.100	.081	-3.685	134	.000	-.81039	.21992	-1.24535	-.37542
	Equal variances not assumed			-3.702	132.766	.000	-.81039	.21891	-1.24340	-.37738
Brand Memory	Equal variances assumed	.070	.791	8.496	134	.000	1.319	.155	1.012	1.627
	Equal variances not assumed			8.477	131.588	.000	1.319	.156	1.012	1.627

2. Linear Regression : Media multitasking effect on Brand Memory

Model Summary[b]

Model	R				Change Statistics

		R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.592[a]	.350	.345	.905	.350	72.181	1	134	.000	2.063

a. Predictors: (Constant), Cond=No Media Multitasking

b. Dependent Variable: Brand Memory

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.144	1	59.144	72.181	.000[b]
	Residual	109.797	134	.819		
	Total	168.941	135			

a. Dependent Variable: Brand Memory

b. Predictors: (Constant), Cond=No Media Multitasking

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	.771	.108		7.130	.000					
	Cond=No Media Multitasking	1.319	.155	.592	8.496	.000	.592	.592	.592	1.000	1.000

a. Dependent Variable: Brand Memory

3. Mediation of difficulty in the relationship between media multitasking and brand memory

```
**************** PROCESS Procedure for SPSS Version 3.4
****************

**********************************************************************
****
Model  : 4
    Y  : BR_Mem
    X  : Cond
    M  : Dif_Eff

Sample
Size:  136

**********************************************************************
****
OUTCOME VARIABLE:
 Dif_Eff
```

```
Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3033      .0920     1.6430    13.5786     1.0000   134.0000
.0003

Model
              coeff         se          t          p       LLCI
ULCI
constant     1.0078      .3508     2.8730      .0047      .3140
1.7016
Cond          .8104      .2199     3.6849      .0003      .3754
1.2454

Standardized coefficients
          coeff
Cond      .6047

Covariance matrix of regression parameter estimates:
           constant       Cond
constant      .1230     -.0733
Cond         -.0733      .0484

**********************************************************************
****
OUTCOME VARIABLE:
 BR_Mem

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .7171      .5143      .6170    70.4102     2.0000   133.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant     3.0527      .2215    13.7831      .0000     2.6146
3.4907
Cond        -1.6071      .1414   -11.3634      .0000    -1.8869    -
1.3274
Dif_Eff       .3550      .0529     6.7052      .0000      .2502
.4597

Standardized coefficients
             coeff
Cond       -1.4367
Dif_Eff      .4252

Covariance matrix of regression parameter estimates:
           constant       Cond    Dif_Eff
constant      .0491     -.0252     -.0028
Cond         -.0252      .0200     -.0023
Dif_Eff      -.0028     -.0023      .0028

Test(s) of X by M interaction:
          F        df1        df2          p
      .0189     1.0000   132.0000      .8908
```

```
************************* TOTAL EFFECT MODEL
***************************
OUTCOME VARIABLE:
 BR_Mem

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .5917      .3501      .8194    72.1808     1.0000   134.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant     3.4104      .2477    13.7671      .0000     2.9204
3.9003
Cond        -1.3195      .1553    -8.4959      .0000    -1.6267    -
1.0123

Standardized coefficients
          coeff
Cond    -1.1795

Covariance matrix of regression parameter estimates:
           constant       Cond
constant      .0614     -.0365
Cond         -.0365      .0241

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y
**************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps
    -1.3195      .1553    -8.4959      .0000    -1.6267    -1.0123
-1.1795

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps
    -1.6071      .1414   -11.3634      .0000    -1.8869    -1.3274
-1.4367

Indirect effect(s) of X on Y:
            Effect     BootSE   BootLLCI   BootULCI
Dif_Eff      .2877      .0923      .1224      .4844

Partially standardized indirect effect(s) of X on Y:
            Effect     BootSE   BootLLCI   BootULCI
Dif_Eff      .2571      .0861      .1079      .4453

*********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000
```

```
NOTE: Standardized coefficients for dichotomous or multicategorical X
are in
      partially standardized form.

------ END MATRIX -----
```

4. Effect of Physical Difficulty on TV Brand Memory (Study 2B)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.244[a]	.060	.053	.682	.060	9.009	1	142	.003	2.074

a. Predictors: (Constant), Cond=Ph_Diff

b. Dependent Variable: Br_Mem

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4.186	1	4.186	9.009	.003[b]
	Residual	65.974	142	.465		
	Total	70.160	143			

a. Dependent Variable: Br_Mem

b. Predictors: (Constant), Cond=Ph_Diff

Coefficients[a]

Model		Unstandardized Coefficients: B	Std. Error	Standardized Coefficients: Beta	t	Sig.	Correlations: Zero-order	Partial	Part	Collinearity Statistics: Tolerance	VIF
1	(Constant)	.579	.070		8.279	.000					
	Cond=Ph_Diff	.360	.120	.244	3.001	.003	.244	.244	.244	1.000	1.000

a. Dependent Variable: Br_Mem

5. Effect of Physical Difficulty on Mobile Brand Memory (Study 2B)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics: R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.294[a]	.086	.080	.658	.086	13.412	1	142	.000	1.930

a. Predictors: (Constant), Cond=Ph_Diff

b. Dependent Variable: Mo_Mem

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.801	1	5.801	13.412	.000[b]
	Residual	61.421	142	.433		
	Total	67.222	143			

a. Dependent Variable: Mo_Mem

b. Predictors: (Constant), Cond=Ph_Diff

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Correlations Partial	Correlations Part	Collinearity Statistics Tolerance	Collinearity Statistics VIF
1	(Constant)	.495	.067		7.332	.000					
	Cond=Ph_Diff	.424	.116	.294	3.662	.000	.294	.294	.294	1.000	1.000

a. Dependent Variable: Mo_Mem

6. Effect of Cognitive Difficulty on Mobile Brand Memory (Study 2B)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.338[a]	.114	.108	.648	.114	18.289	1	142	.000	2.002

a. Predictors: (Constant), Cond=Cg_Diff

b. Dependent Variable: Mo_Mem

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.670	1	7.670	18.289	.000[b]
	Residual	59.552	142	.419		
	Total	67.222	143			

a. Dependent Variable: Mo_Mem

b. Predictors: (Constant), Cond=Cg_Diff

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
1	(Constant)	.802	.066		12.135	.000					
	Cond=Cg_Diff	-.490	.114	-.338	-4.277	.000	-.338	-.338	-.338	1.000	1.000

a. Dependent Variable: Mo_Mem

7. Effect of Cognitive Difficulty on TV Brand Memory (Study 2B)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.310[a]	.096	.089	.668	.096	15.047	1	142	.000	2.164

a. Predictors: (Constant), Cond=Cg_Diff

b. Dependent Variable: Br_Mem

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	6.722	1	6.722	15.047	.000[b]
	Residual	63.438	142	.447		
	Total	70.160	143			

a. Dependent Variable: Br_Mem

b. Predictors: (Constant), Cond=Cg_Diff

Coefficients[a]

Model		Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.	Correlations Zero-order	Partial	Part	Collinearity Statistics Tolerance	VIF
1	(Constant)	.854	.068		12.521	.000					
	Cond=Cg_Diff	-.458	.118	-.310	-3.879	.000	-.310	-.310	-.310	1.000	1.000

a. Dependent Variable: Br_Mem

Appendix G: Study 3 Invitation

How Reality Television Impacts Our Brain: Why People Love Reality-TV

<u>Invitation to participate in a TV viewing Experiment</u>

I am exploring the daily behaviour of UK television viewers and their motivation to watch reality TV. Through this study, I hope to understand why people gravitate towards reality TV and what they achieve from it. To answer the above question, I am looking for people who have been living in the UK for the past three years, and happy to participate in an experiment, which involves watching a video clip of almost 8 minutes and answering some questions related to it. ***Total time- 15 minutes approx.***

For your valuable time you'll earn a **<u>£5 Starbucks Coffee Voucher</u>**

To participate please contact Shikhar Bhaskar, shikhar.bhaskar@plymouth.ac.uk

shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379	shikhar.bhaskar@plymouth.ac.uk, 07727393379

Appendix H: Study 3 Questionnaire

Thank you for watching the video clip. This video clip is a compilation from various scenes of TV series *Love Island* season 5, which aired on ITV2 from 3rd June 2019 till 29th June 2019.

Q1. Please mark a ✓ to represent your level of agreement with the following statements (strongly disagree to strongly agree).

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I like watching Love Island							
If I know Love Island is going to be on Television, I would look forward to watching it.							
I like watching Love Island more than I do							

most other shows							

Q2. Please mark a ✓ to represent your level of agreement with the following statements (strongly disagree to strongly agree).

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I found the video clip fascinating							
I found the video clip exciting							
I found the video clip interesting							
I watched the video clip attentively							

Q3. During the time the clip played, how much attention did you pay to each of the following devices?

Please mark your level of attention on a scale from 1 to 7, where 1=No attention at all and 7=High level of attention.

3A. TV

1	2	3	4	5	6	7

3B. Mobile phone

1	2	3	4	5	6	7

Q4. To what extent were chat messages sent to your mobile device related to Love Island?

1 = not at all related and 7 = strongly related

1	2	3	4	5	6	7

Q5. To what extent were the advertisements appearing on your mobile device related to Love Island?

1 = not at all related and 7 = strongly related

1	2	3	4	5	6	7

Q6A. You may have noticed that contestants on the show were sometimes wearing, using or close by to a specific product or brand. Did you see them?

Try and remember what you saw and then state the product and associated brand name in the box for each.

For example, if you saw a contestant wearing a pair of Adidas shoes then, *Shoes* will be product, and *Adidas* the brand.

Products

____

Brands

____

Q6B. Can you recall the brand / company shown in the video clip for each of the following types of product (e.g. car, cap / hat).

Car _______________________________

Cap/Hat _______________________________

Q6C. Mark the brands you recognise from the Love Island video clip?

BMW	MITSUBISHI MOTORS
RANGE ROVER	
NIKE	THE NORTH FACE
R Rewired	NY

Q6D(i). Do you remember watching this scene in the video-clip?

YES	NO

Q6D(ii). Do you remember watching this scene in the video-clip?

YES	NO

Brand Familiarity

Q7. Please rate your level of agreement with the following statements?

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I am familiar with Range Rover							
I am familiar with Rewired							
I have knowledge about Range Rover							
I have knowledge about Rewired							
I have seen advertisements of Range Rover							
I have seen advertisement of Rewired							

Q8A. How would you rate the Range Rover Brand on the following items?

	1	2	3	4	5	6	7	
Dislike a lot								Like a lot
Unappealing								Appealing
Bad								Good

Q8B.How would you rate the Rewired Brand on the following items?

	1	2	3	4	5	6	7	
Dislike a lot								Like a lot
Unappealing								Appealing
Bad								Good

Q9. The brands appearing in the show were

1= Difficult to understand 7= Easy to understand

1	2	3	4	5	6	7

1=Not at all eye catching 7=Eye Catching

1	2	3	4	5	6	7

1=Not all clear 7=Clear

1	2	3	4	5	6	7

1=Difficult to comprehend 7=Easy to comprehend

1	2	3	4	5	6	7

Q10. Please mark a ✓ to your level of agreement for the following statements from strongly disagree to strongly agree.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I enjoy having a clear and structured mode of life							
I find that a consistent routine enables me to enjoy life more							
I don't like situations that are uncertain							
I hate to change my plans at the last minute							

Q11. Please mark your level of agreement with the following statements.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I believe my online personal data have been misused too often.							

I am concerned about the potential misuse of personal data.							
I feel uncomfortable when data is shared without permission.							

Q12. Please mark your level of agreement with the following statements.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
Cars are part of my self-image.							
Cars portray an image of me to others.							
Cars are fascinating to me.							
Caps/Hats are part of my self-image.							
Caps/Hats portray an image of me to others.							
Caps/Hats are fascinating to me.							

Q.13 Please mark your level of agreement with the following statements.

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neutral	Slightly Agree	Moderately Agree	Strongly Agree
I approve of studios' increased use of product placements in TV Shows.							

Using brand name products in TV shows is OK with me.							
I do not mind seeing brand name products in TV shows as long as they are realistically shown.							
TV shows should use existing brands rather than fictitious brands.							

Q14A. On a scale from 1 to 7, please mark the following attributes for the statement -As an <u>endorser of RANGE ROVER</u>, I think Love Island and its participants are:

1= Highly Unattractive 7=Highly Attractive

1	2	3	4	5	6	7

1= Ugly 7=Beautiful

1	2	3	4	5	6	7

1= Not at all Sexy 7=Sexy

1	2	3	4	5	6	7

1= Highly Insincere 7=Highly Sincere

1	2	3	4	5	6	7

1= Untrustworthy 7= Highly Trustworthy

1	2	3	4	5	6	7

1=Undependable 7=Highly Dependable

1	2	3	4	5	6	7

1= Unreliable 7=Highly Reliable

1	2	3	4	5	6	7

1= Not all Knowledgeable 7=Highly Knowledgeable

1	2	3	4	5	6	7

1= Unqualified 7=Highly Qualified

1	2	3	4	5	6	7

1= Inexperienced 7=Highly Experienced

1	2	3	4	5	6	7

Q14B. On a scale from 1 to 7, please mark the following attributes for the statement -As an endorser of REWIRED, I think Love Island and its participants are:

1= Highly Unattractive 7=Highly Attractive

1	2	3	4	5	6	7

1= Ugly 7=Beautiful

1	2	3	4	5	6	7

1= Not at all Sexy 7=Sexy

1	2	3	4	5	6	7

1= Highly Insincere 7=Highly Sincere

1	2	3	4	5	6	7

1= Untrustworthy 7= Highly Trustworthy

1	2	3	4	5	6	7

1=Undependable 7=Highly Dependable

1	2	3	4	5	6	7

1= Unreliable 7=Highly Reliable

1	2	3	4	5	6	7

1= Not all Knowledgeable 7=Highly Knowledgeable

1	2	3	4	5	6	7

1= Unqualified 7=Highly Qualified

1	2	3	4	5	6	7

1= Inexperienced 7=Highly Experienced

1	2	3	4	5	6	7

Q15.How old are you? _____ (in years)

Q16. What is your gender?

Male	Female

Q17. What is your highest level of education qualification (Mark adjacent to your level of education)?

High School	
Senior Secondary	
Bachelors	
Masters	
PhD	
None	

Thank you for your time!

Appendix I: Data Analysis Study 3

1. Model 1a: Mediation by Processing Fluency between Synced Ads and Brand Memory

```
Model  : 4
    Y  : Br_mem
    X  : AdSyDum
    M  : Fluency

Sample
Size:  126

**********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
  R       R-sq       MSE          F        df1        df2          p
  .2331    .0543    2.4530     7.1250     1.0000   124.0000
.0086

Model
              coeff         se          t          p       LLCI
ULCI
constant     3.9905      .1762    22.6460      .0000     3.6417
4.3393
AdSyDum       .7701      .2885     2.6693      .0086      .1991
1.3412

Standardized coefficients
             coeff
AdSyDum      .4801

Covariance matrix of regression parameter estimates:
           constant    AdSyDum
constant      .0311     -.0311
AdSyDum      -.0311      .0832

**********************************************************************
****
OUTCOME VARIABLE:
 Br_mem

Model Summary
  R       R-sq       MSE          F        df1        df2          p
  .7366    .5425    1.1758    72.9379     2.0000   123.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant      .0603      .2765      .2179      .8278     -.4870
.6075
AdSyDum      1.2474      .2054     6.0730      .0000      .8409
1.6540
```

```
Fluency       .5432      .0622     8.7368      .0000      .4201
.6663

Standardized coefficients
             coeff
AdSyDum      .7844
Fluency      .5479

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .0764     -.0030     -.0154
AdSyDum      -.0030      .0422     -.0030
Fluency      -.0154     -.0030      .0039

Test(s) of X by M interaction:
         F       df1        df2          p
      .3549     1.0000   122.0000      .5524

************************** TOTAL EFFECT MODEL
****************************
OUTCOME VARIABLE:
 Br_mem

Model Summary
   R       R-sq        MSE          F        df1        df2          p
  .5086     .2586     1.8901    43.2623     1.0000   124.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant     2.2278      .1547    14.4033      .0000     1.9217
2.5340
AdSyDum      1.6658      .2533     6.5774      .0000     1.1645
2.1670

Standardized coefficients
             coeff
AdSyDum     1.0475

Covariance matrix of regression parameter estimates:
           constant    AdSyDum
constant      .0239     -.0239
AdSyDum      -.0239      .0641

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y
**************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps
     1.6658      .2533     6.5774      .0000     1.1645     2.1670
1.0475

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps
     1.2474      .2054     6.0730      .0000      .8409     1.6540
.7844

Indirect effect(s) of X on Y:
```

```
             Effect     BootSE   BootLLCI   BootULCI
Fluency      .4183      .1616      .1002      .7388

Partially standardized indirect effect(s) of X on Y:
             Effect     BootSE   BootLLCI   BootULCI
Fluency      .2630      .0951      .0674      .4470

********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000

NOTE: Standardized coefficients for dichotomous or multicategorical X
are in
      partially standardized form.

------ END MATRIX -----
```

2. Model 1b Mediation by Processing Fluency between Synced Ads and Brand Attitude

```
**********************************************************************
****
Model  : 4
    Y  : Brnd_ATD
    X  : AdSyDum
    M  : Fluency

Sample
Size:  126

**********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .2331      .0543     2.4530     7.1250     1.0000   124.0000
.0086

Model
              coeff         se          t          p       LLCI
ULCI
constant     3.9905      .1762    22.6460      .0000     3.6417
4.3393
AdSyDum       .7701      .2885     2.6693      .0086      .1991
1.3412

Standardized coefficients
             coeff
AdSyDum      .4801
```

```
Covariance matrix of regression parameter estimates:
           constant    AdSyDum
constant      .0311     -.0311
AdSyDum      -.0311      .0832

**********************************************************************
****
OUTCOME VARIABLE:
 Brnd_ATD

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3493      .1220     1.6422     8.5468     2.0000   123.0000
.0003

Model
              coeff         se          t          p       LLCI
ULCI
constant     3.2800      .3267    10.0387      .0000     2.6333
3.9268
AdSyDum      -.4834      .2428    -1.9913      .0487     -.9639     -
.0029
Fluency       .2930      .0735     3.9876      .0001      .1476
.4384

Standardized coefficients
             coeff
AdSyDum     -.3563
Fluency      .3464

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .1068     -.0042     -.0215
AdSyDum      -.0042      .0589     -.0042
Fluency      -.0215     -.0042      .0054

Test(s) of X by M interaction:
          F        df1        df2          p
      .1066     1.0000   122.0000      .7447

************************* TOTAL EFFECT MODEL
****************************
OUTCOME VARIABLE:
 Brnd_ATD

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .0922      .0085     1.8395     1.0643     1.0000   124.0000
.3043

Model
              coeff         se          t          p       LLCI
ULCI
constant     4.4492      .1526    29.1573      .0000     4.1472
4.7513
AdSyDum      -.2578      .2498    -1.0316      .3043     -.7523
.2368
```

```
Standardized coefficients
             coeff
AdSyDum     -.1900

Covariance matrix of regression parameter estimates:
           constant    AdSyDum
constant      .0233     -.0233
AdSyDum      -.0233      .0624

************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y
**************

Total effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c_ps
     -.2578      .2498    -1.0316      .3043     -.7523      .2368
-.1900

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
c'_ps
     -.4834      .2428    -1.9913      .0487     -.9639     -.0029
-.3563

Indirect effect(s) of X on Y:
            Effect     BootSE   BootLLCI   BootULCI
Fluency      .2256      .1005      .0484      .4399

Partially standardized indirect effect(s) of X on Y:
            Effect     BootSE   BootLLCI   BootULCI
Fluency      .1663      .0706      .0376      .3137

*********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000

NOTE: Standardized coefficients for dichotomous or multicategorical X
are in
      partially standardized form.

------ END MATRIX -----
```

3. Conditional Process: Model 2a

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4
*****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3
```

```
**********************************************************************
Model  : 7
    Y  : Br_mem
    X  : AdSyDum
    M  : Fluency
    W  : PRV_Ci3

Sample
Size:  126

**********************************************************************
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2          p
      .4439      .1970     2.1170     9.9795     3.0000   122.0000      .0000

Model
              coeff         se          t          p       LLCI       ULCI
constant     6.0054      .9872     6.0835      .0000     4.0512     7.9595
AdSyDum     -6.3714     1.5906    -4.0056      .0001    -9.5203    -3.2226
PRV_Ci3      -.3553      .1717    -2.0697      .0406     -.6951     -.0155
Int_1        1.2468      .2741     4.5481      .0000      .7041     1.7894

Product terms key:
 Int_1    :        AdSyDum  x        PRV_Ci3

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    PRV_Ci3      Int_1
constant      .9745     -.9745     -.1671      .1671
AdSyDum      -.9745     2.5302      .1671     -.4298
PRV_Ci3      -.1671      .1671      .0295     -.0295
Int_1         .1671     -.4298     -.0295      .0751

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .1361    20.6856     1.0000   122.0000      .0000
----------
    Focal predict: AdSyDum  (X)
          Mod var: PRV_Ci3  (W)

Conditional effects of the focal predictor at values of the
moderator(s):

    PRV_Ci3     Effect         se          t          p       LLCI       ULCI
     4.7276     -.4772      .3820    -1.2495      .2139    -1.2334      .2789
     5.7007      .7360      .2683     2.7434      .0070      .2049     1.2671
```

```
     6.6739     1.9493      .3747     5.2024      .0000     1.2076
2.6911

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce
plot.

DATA LIST FREE/
   AdSyDum    PRV_Ci3    Fluency    .
BEGIN DATA.
      .0000     4.7276     4.3257
     1.0000     4.7276     3.8484
      .0000     5.7007     3.9799
     1.0000     5.7007     4.7159
      .0000     6.6739     3.6342
     1.0000     6.6739     5.5835
END DATA.
GRAPH/SCATTERPLOT=
 PRV_Ci3  WITH     Fluency  BY       AdSyDum  .

**********************************************************************
****
OUTCOME VARIABLE:
 Br_mem

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .7366      .5425     1.1758    72.9379     2.0000   123.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant      .0603      .2765      .2179      .8278     -.4870
.6075
AdSyDum      1.2474      .2054     6.0730      .0000      .8409
1.6540
Fluency       .5432      .0622     8.7368      .0000      .4201
.6663

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .0764     -.0030     -.0154
AdSyDum      -.0030      .0422     -.0030
Fluency      -.0154     -.0030      .0039

Test(s) of X by M interaction:
          F        df1        df2          p
      .3549     1.0000   122.0000      .5524

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y
*****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     1.2474      .2054     6.0730      .0000      .8409     1.6540

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
```

```
 AdSyDum      ->     Fluency      ->     Br_mem

    PRV_Ci3      Effect      BootSE    BootLLCI    BootULCI
     4.7276      -.2592       .1945      -.6354       .1287
     5.7007       .3998       .1379       .1328       .6747
     6.6739      1.0588       .2080       .6583      1.4710

      Index of moderated mediation:
             Index      BootSE    BootLLCI    BootULCI
PRV_Ci3      .6772       .1507       .3798       .9772

 Pairwise contrasts between conditional indirect effects (Effect1
minus Effect2)
    Effect1     Effect2    Contrast      BootSE    BootLLCI    BootULCI
      .3998      -.2592       .6590       .1467       .3696       .9510
     1.0588      -.2592      1.3181       .2934       .7392      1.9020
     1.0588       .3998       .6590       .1467       .3696       .9510
---

*********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: Standardized coefficients not available for models with
moderators.

------ END MATRIX -----
```

4. Conditional Process: Model 2b

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4
*****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**********************************************************************
****
Model  : 7
    Y  : Brnd_ATD
    X  : AdSyDum
    M  : Fluency
    W  : PRV_Ci3

Sample
Size:  126
```

```
*********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .4439      .1970     2.1170     9.9795     3.0000   122.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant     6.0054      .9872     6.0835      .0000     4.0512
7.9595
AdSyDum     -6.3714     1.5906    -4.0056      .0001    -9.5203    -
3.2226
PRV_Ci3      -.3553      .1717    -2.0697      .0406     -.6951     -
.0155
Int_1        1.2468      .2741     4.5481      .0000      .7041
1.7894

Product terms key:
 Int_1    :        AdSyDum  x        PRV_Ci3

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    PRV_Ci3      Int_1
constant      .9745     -.9745     -.1671      .1671
AdSyDum      -.9745     2.5302      .1671     -.4298
PRV_Ci3      -.1671      .1671      .0295     -.0295
Int_1         .1671     -.4298     -.0295      .0751

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .1361    20.6856     1.0000   122.0000      .0000
----------
    Focal predict: AdSyDum  (X)
          Mod var: PRV_Ci3  (W)

Conditional effects of the focal predictor at values of the
moderator(s):

    PRV_Ci3     Effect         se          t          p       LLCI
ULCI
     4.7276     -.4772      .3820    -1.2495      .2139    -1.2334
.2789
     5.7007      .7360      .2683     2.7434      .0070      .2049
1.2671
     6.6739     1.9493      .3747     5.2024      .0000     1.2076
2.6911

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce
plot.

DATA LIST FREE/
   AdSyDum    PRV_Ci3    Fluency    .
BEGIN DATA.
      .0000     4.7276     4.3257
```

```
     1.0000     4.7276     3.8484
      .0000     5.7007     3.9799
     1.0000     5.7007     4.7159
      .0000     6.6739     3.6342
     1.0000     6.6739     5.5835
END DATA.
GRAPH/SCATTERPLOT=
 PRV_Ci3  WITH     Fluency  BY       AdSyDum  .

**********************************************************************
****
OUTCOME VARIABLE:
 Brnd_ATD

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3493      .1220     1.6422     8.5468     2.0000   123.0000
.0003

Model
              coeff         se          t          p       LLCI
ULCI
constant     3.2800      .3267    10.0387      .0000     2.6333
3.9268
AdSyDum      -.4834      .2428    -1.9913      .0487     -.9639     -
.0029
Fluency       .2930      .0735     3.9876      .0001      .1476
.4384

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .1068     -.0042     -.0215
AdSyDum      -.0042      .0589     -.0042
Fluency      -.0215     -.0042      .0054

Test(s) of X by M interaction:
          F        df1        df2          p
      .1066     1.0000   122.0000      .7447

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y
*****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     -.4834      .2428    -1.9913      .0487     -.9639     -.0029

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 AdSyDum     ->    Fluency     ->    Brnd_ATD

    PRV_Ci3     Effect     BootSE   BootLLCI   BootULCI
     4.7276     -.1398      .1176     -.3908      .0726
     5.7007      .2157      .0924      .0599      .4219
     6.6739      .5711      .1836      .2496      .9709

      Index of moderated mediation:
             Index     BootSE   BootLLCI   BootULCI
PRV_Ci3      .3653      .1268      .1479      .6396
```

```
 Pairwise contrasts between conditional indirect effects (Effect1
minus Effect2)
    Effect1    Effect2   Contrast     BootSE   BootLLCI   BootULCI
      .2157     -.1398      .3555      .1234      .1439      .6224
      .5711     -.1398      .7110      .2468      .2878     1.2448
      .5711      .2157      .3555      .1234      .1439      .6224
---

*********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: Standardized coefficients not available for models with
moderators.

------ END MATRIX -----
```

5. **Conditional Process Model 3a**

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4
*****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**********************************************************************
****
Model  : 7
    Y  : Br_mem
    X  : AdSyDum
    M  : Fluency
    W  : Src_Atra

Sample
Size:  126

**********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3972      .1577     2.2206     7.6159     3.0000   122.0000
.0001

Model
```

```
              coeff         se          t          p       LLCI
ULCI
constant     2.4909      .5124     4.8612      .0000     1.4766
3.5053
AdSyDum      3.9660      .9187     4.3168      .0000     2.1473
5.7848
Src_Atra      .3215      .1038     3.0970      .0024      .1160
.5270
Int_1        -.6828      .1871    -3.6489      .0004    -1.0532     -
.3124

Product terms key:
 Int_1    :        AdSyDum  x        Src_Atra

Covariance matrix of regression parameter estimates:
           constant    AdSyDum   Src_Atra      Int_1
constant      .2626     -.2626     -.0503      .0503
AdSyDum      -.2626      .8441      .0503     -.1641
Src_Atra     -.0503      .0503      .0108     -.0108
Int_1         .0503     -.1641     -.0108      .0350

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0919    13.3145     1.0000   122.0000      .0004
----------
    Focal predict: AdSyDum  (X)
          Mod var: Src_Atra (W)

Conditional effects of the focal predictor at values of the
moderator(s):

   Src_Atra     Effect         se          t          p       LLCI
ULCI
     3.1327     1.8271      .3998     4.5705      .0000     1.0358
2.6185
     4.6760      .7734      .2745     2.8170      .0057      .2299
1.3168
     6.2194     -.2804      .3971     -.7061      .4815    -1.0666
.5058

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce
plot.

DATA LIST FREE/
   AdSyDum    Src_Atra   Fluency    .
BEGIN DATA.
      .0000     3.1327     3.4980
     1.0000     3.1327     5.3251
      .0000     4.6760     3.9941
     1.0000     4.6760     4.7675
      .0000     6.2194     4.4903
     1.0000     6.2194     4.2099
END DATA.
GRAPH/SCATTERPLOT=
 Src_Atra WITH     Fluency  BY       AdSyDum  .

**********************************************************************
****
OUTCOME VARIABLE:
 Br_mem
```

```
Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .7366      .5425     1.1758    72.9379     2.0000   123.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant      .0603      .2765      .2179      .8278     -.4870
.6075
AdSyDum      1.2474      .2054     6.0730      .0000      .8409
1.6540
Fluency       .5432      .0622     8.7368      .0000      .4201
.6663

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .0764     -.0030     -.0154
AdSyDum      -.0030      .0422     -.0030
Fluency      -.0154     -.0030      .0039

Test(s) of X by M interaction:
          F        df1        df2          p
      .3549     1.0000   122.0000      .5524

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y
*****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     1.2474      .2054     6.0730      .0000      .8409     1.6540

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 AdSyDum     ->    Fluency     ->    Br_mem

   Src_Atra     Effect     BootSE   BootLLCI   BootULCI
     3.1327      .9925      .2455      .5255     1.5023
     4.6760      .4201      .1511      .1235      .7192
     6.2194     -.1523      .2287     -.6108      .2946

      Index of moderated mediation:
              Index     BootSE   BootLLCI   BootULCI
Src_Atra     -.3709      .1185     -.6181     -.1452

 Pairwise contrasts between conditional indirect effects (Effect1
minus Effect2)
    Effect1    Effect2   Contrast     BootSE   BootLLCI   BootULCI
      .4201      .9925     -.5724      .1829     -.9539     -.2241
     -.1523      .9925    -1.1448      .3658    -1.9078     -.4482
     -.1523      .4201     -.5724      .1829     -.9539     -.2241
---

*********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000
```

```
Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: Standardized coefficients not available for models with
moderators.

------ END MATRIX -----
```

6. Conditional Process Model 3b

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4
*****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**********************************************************************
****
Model  : 7
    Y  : Brnd_ATD
    X  : AdSyDum
    M  : Fluency
    W  : Src_Atra

Sample
Size:  126

**********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3972      .1577     2.2206     7.6159     3.0000   122.0000
.0001

Model
              coeff         se          t          p       LLCI
ULCI
constant     2.4909      .5124     4.8612      .0000     1.4766
3.5053
AdSyDum      3.9660      .9187     4.3168      .0000     2.1473
5.7848
Src_Atra      .3215      .1038     3.0970      .0024      .1160
.5270
Int_1        -.6828      .1871    -3.6489      .0004    -1.0532     -
.3124

Product terms key:
 Int_1    :        AdSyDum  x        Src_Atra
```

```
Covariance matrix of regression parameter estimates:
           constant    AdSyDum   Src_Atra      Int_1
constant       .2626     -.2626     -.0503      .0503
AdSyDum       -.2626      .8441      .0503     -.1641
Src_Atra      -.0503      .0503      .0108     -.0108
Int_1          .0503     -.1641     -.0108      .0350

Test(s) of highest order unconditional interaction(s):
       R2-chng          F        df1        df2          p
X*W      .0919    13.3145     1.0000   122.0000      .0004
----------
    Focal predict: AdSyDum  (X)
          Mod var: Src_Atra (W)

Conditional effects of the focal predictor at values of the
moderator(s):

   Src_Atra     Effect         se          t          p       LLCI
ULCI
     3.1327     1.8271      .3998     4.5705      .0000     1.0358
2.6185
     4.6760      .7734      .2745     2.8170      .0057      .2299
1.3168
     6.2194     -.2804      .3971     -.7061      .4815    -1.0666
.5058

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce
plot.

DATA LIST FREE/
   AdSyDum    Src_Atra   Fluency    .
BEGIN DATA.
      .0000     3.1327     3.4980
     1.0000     3.1327     5.3251
      .0000     4.6760     3.9941
     1.0000     4.6760     4.7675
      .0000     6.2194     4.4903
     1.0000     6.2194     4.2099
END DATA.
GRAPH/SCATTERPLOT=
 Src_Atra WITH     Fluency  BY       AdSyDum  .

**********************************************************************
****
OUTCOME VARIABLE:
 Brnd_ATD

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3493      .1220     1.6422     8.5468     2.0000   123.0000
.0003

Model
             coeff         se          t          p       LLCI
ULCI
constant     3.2800      .3267    10.0387      .0000     2.6333
3.9268
```

```
AdSyDum      -.4834      .2428    -1.9913      .0487     -.9639     -
.0029
Fluency       .2930      .0735     3.9876      .0001      .1476
.4384

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .1068     -.0042     -.0215
AdSyDum      -.0042      .0589     -.0042
Fluency      -.0215     -.0042      .0054

Test(s) of X by M interaction:
          F        df1        df2          p
      .1066     1.0000   122.0000      .7447

***************** DIRECT AND INDIRECT EFFECTS OF X ON Y
*****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     -.4834      .2428    -1.9913      .0487     -.9639     -.0029

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 AdSyDum     ->    Fluency     ->    Brnd_ATD

   Src_Atra     Effect     BootSE   BootLLCI   BootULCI
     3.1327      .5353      .1759      .2341      .9195
     4.6760      .2266      .0946      .0600      .4319
     6.2194     -.0822      .1299     -.3606      .1595

      Index of moderated mediation:
              Index     BootSE   BootLLCI   BootULCI
Src_Atra     -.2001      .0792     -.3727     -.0673

 Pairwise contrasts between conditional indirect effects (Effect1
minus Effect2)
    Effect1    Effect2   Contrast     BootSE   BootLLCI   BootULCI
      .2266      .5353     -.3088      .1223     -.5752     -.1038
     -.0822      .5353     -.6175      .2446    -1.1503     -.2077
     -.0822      .2266     -.3088      .1223     -.5752     -.1038
---

********************** ANALYSIS NOTES AND ERRORS
************************

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence
intervals:
  5000

W values in conditional tables are the mean and +/- SD from the mean.

NOTE: Standardized coefficients not available for models with
moderators.

------ END MATRIX -----
```

7. Conditional Model 4a

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4
*****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**********************************************************************
****
Model  : 9
    Y  : Br_mem
    X  : AdSyDum
    M  : Fluency
    W  : PRV_Ci3
    Z  : Src_Atra

Sample
Size:  126

**********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .5351      .2864     1.9128     9.6310     5.0000   120.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant     4.5764     1.0276     4.4533      .0000     2.5417
6.6110
AdSyDum     -3.3400     1.7944    -1.8614      .0651    -6.8928
.2127
PRV_Ci3      -.3738      .1633    -2.2893      .0238     -.6970     -
.0505
Int_1        1.2064      .2626     4.5942      .0000      .6865
1.7263
Src_Atra      .3288      .0964     3.4110      .0009      .1379
.5196
Int_2        -.5980      .1752    -3.4135      .0009     -.9448     -
.2511

Product terms key:
 Int_1    :        AdSyDum  x        PRV_Ci3
 Int_2    :        AdSyDum  x        Src_Atra

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    PRV_Ci3      Int_1   Src_Atra
Int_2
constant     1.0560    -1.0560     -.1487      .1487     -.0404
.0404
```

```
AdSyDum     -1.0560     3.2198      .1487     -.4139      .0404     -
.1678
PRV_Ci3      -.1487      .1487      .0267     -.0267     -.0005
.0005
Int_1         .1487     -.4139     -.0267      .0690      .0005
.0042
Src_Atra     -.0404      .0404     -.0005      .0005      .0093     -
.0093
Int_2         .0404     -.1678      .0005      .0042     -.0093
.0307

Test(s) of highest order unconditional interaction(s):
           R2-chng          F        df1        df2          p
X*W          .1255    21.1064     1.0000   120.0000      .0000
X*Z          .0693    11.6520     1.0000   120.0000      .0009
BOTH(X)      .2134    17.9432     2.0000   120.0000      .0000
----------
    Focal predict: AdSyDum  (X)
          Mod var: PRV_Ci3  (W)
          Mod var: Src_Atra (Z)

Conditional effects of the focal predictor at values of the
moderator(s):

    PRV_Ci3   Src_Atra     Effect         se          t          p
LLCI       ULCI
     4.7276     3.1327      .4899      .4695     1.0434      .2988
-.4397     1.4194
     4.7276     4.6760     -.4330      .3649    -1.1868      .2376
-1.1554      .2894
     4.7276     6.2194    -1.3559      .4382    -3.0942      .0025
-2.2235     -.4883
     5.7007     3.1327     1.6638      .3740     4.4490      .0000
.9234     2.4043
     5.7007     4.6760      .7409      .2551     2.9049      .0044
.2359     1.2459
     5.7007     6.2194     -.1820      .3694     -.4926      .6232
-.9133      .5494
     6.6739     3.1327     2.8378      .4358     6.5120      .0000
1.9750     3.7006
     6.6739     4.6760     1.9149      .3572     5.3608      .0000
1.2077     2.6221
     6.6739     6.2194      .9920      .4599     2.1572      .0330
.0815     1.9025

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce
plot.

DATA LIST FREE/
   AdSyDum    PRV_Ci3    Src_Atra   Fluency    .
BEGIN DATA.
      .0000     4.7276     3.1327     3.8394
     1.0000     4.7276     3.1327     4.3292
      .0000     4.7276     4.6760     4.3468
     1.0000     4.7276     4.6760     3.9138
      .0000     4.7276     6.2194     4.8542
     1.0000     4.7276     6.2194     3.4983
      .0000     5.7007     3.1327     3.4756
     1.0000     5.7007     3.1327     5.1395
      .0000     5.7007     4.6760     3.9831
```

```
     1.0000     5.7007     4.6760     4.7240
      .0000     5.7007     6.2194     4.4905
     1.0000     5.7007     6.2194     4.3085
      .0000     6.6739     3.1327     3.1119
     1.0000     6.6739     3.1327     5.9497
      .0000     6.6739     4.6760     3.6193
     1.0000     6.6739     4.6760     5.5342
      .0000     6.6739     6.2194     4.1268
     1.0000     6.6739     6.2194     5.1188
END DATA.
GRAPH/SCATTERPLOT=
 PRV_Ci3  WITH     Fluency  BY       AdSyDum  /PANEL   ROWVAR=
Src_Atra .

**********************************************************************
****
OUTCOME VARIABLE:
 Br_mem

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .7366      .5425     1.1758    72.9379     2.0000   123.0000
.0000

Model
             coeff         se          t          p       LLCI
ULCI
constant      .0603      .2765      .2179      .8278     -.4870
.6075
AdSyDum      1.2474      .2054     6.0730      .0000      .8409
1.6540
Fluency       .5432      .0622     8.7368      .0000      .4201
.6663

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .0764     -.0030     -.0154
AdSyDum      -.0030      .0422     -.0030
Fluency      -.0154     -.0030      .0039

Test(s) of X by M interaction:
          F        df1        df2          p
      .3549     1.0000   122.0000      .5524

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y
*****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     1.2474      .2054     6.0730      .0000      .8409     1.6540

Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 AdSyDum     ->    Fluency     ->    Br_mem

    PRV_Ci3   Src_Atra     Effect     BootSE   BootLLCI   BootULCI
     4.7276     3.1327      .2661      .2745     -.2416      .8269
     4.7276     4.6760     -.2352      .2021     -.6241      .1813
     4.7276     6.2194     -.7365      .2501    -1.2393     -.2405
```

5.7007	3.1327	.9038	.2146	.5035	1.3494
5.7007	4.6760	.4025	.1329	.1538	.6747
5.7007	6.2194	-.0988	.2131	-.5144	.3337
6.6739	3.1327	1.5414	.2449	1.0738	2.0294
6.6739	4.6760	1.0401	.1940	.6614	1.4272
6.6739	6.2194	.5388	.2673	.0364	1.0934

Indices of partial moderated mediation:

	Index	BootSE	BootLLCI	BootULCI
PRV_Ci3	.6553	.1510	.3582	.9510
Src_Atra	-.3248	.1086	-.5398	-.1142

Pairwise contrasts between conditional indirect effects (Effect1 minus Effect2)

Effect1	Effect2	Contrast	BootSE	BootLLCI	BootULCI
-.2352	.2661	-.5013	.1676	-.8331	-.1762
-.7365	.2661	-1.0026	.3351	-1.6662	-.3524
.9038	.2661	.6377	.1469	.3486	.9255
.4025	.2661	.1364	.2361	-.3289	.5958
-.0988	.2661	-.3649	.3822	-1.1193	.3863
1.5414	.2661	1.2754	.2939	.6972	1.8510
1.0401	.2661	.7741	.3558	.0787	1.4667
.5388	.2661	.2728	.4722	-.6578	1.1916
-.7365	-.2352	-.5013	.1676	-.8331	-.1762
.9038	-.2352	1.1390	.2088	.7280	1.5467
.4025	-.2352	.6377	.1469	.3486	.9255
-.0988	-.2352	.1364	.2361	-.3289	.5958
1.5414	-.2352	1.7767	.3198	1.1552	2.4064
1.0401	-.2352	1.2754	.2939	.6972	1.8510
.5388	-.2352	.7741	.3558	.0787	1.4667
.9038	-.7365	1.6403	.3489	.9665	2.3394
.4025	-.7365	1.1390	.2088	.7280	1.5467
-.0988	-.7365	.6377	.1469	.3486	.9255
1.5414	-.7365	2.2780	.4176	1.4559	3.0933
1.0401	-.7365	1.7767	.3198	1.1552	2.4064
.5388	-.7365	1.2754	.2939	.6972	1.8510
.4025	.9038	-.5013	.1676	-.8331	-.1762
-.0988	.9038	-1.0026	.3351	-1.6662	-.3524
1.5414	.9038	.6377	.1469	.3486	.9255
1.0401	.9038	.1364	.2361	-.3289	.5958
.5388	.9038	-.3649	.3822	-1.1193	.3863
-.0988	.4025	-.5013	.1676	-.8331	-.1762
1.5414	.4025	1.1390	.2088	.7280	1.5467
1.0401	.4025	.6377	.1469	.3486	.9255
.5388	.4025	.1364	.2361	-.3289	.5958
1.5414	-.0988	1.6403	.3489	.9665	2.3394
1.0401	-.0988	1.1390	.2088	.7280	1.5467
.5388	-.0988	.6377	.1469	.3486	.9255
1.0401	1.5414	-.5013	.1676	-.8331	-.1762
.5388	1.5414	-1.0026	.3351	-1.6662	-.3524
.5388	1.0401	-.5013	.1676	-.8331	-.1762

********************** ANALYSIS NOTES AND ERRORS ***********************

Level of confidence for all confidence intervals in output:
95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:

```
  5000

W values in conditional tables are the mean and +/- SD from the mean.

Z values in conditional tables are the mean and +/- SD from the mean.

NOTE: Standardized coefficients not available for models with
moderators.

------ END MATRIX -----
```

8. Conditional Model 4b

```
Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 3.4
*****************

          Written by Andrew F. Hayes, Ph.D.       www.afhayes.com
    Documentation available in Hayes (2018). www.guilford.com/p/hayes3

**********************************************************************
****
Model  : 9
    Y  : Brnd_ATD
    X  : AdSyDum
    M  : Fluency
    W  : PRV_Ci3
    Z  : Src_Atra

Sample
Size:  126

**********************************************************************
****
OUTCOME VARIABLE:
 Fluency

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .5351      .2864     1.9128     9.6310     5.0000   120.0000
.0000

Model
              coeff         se          t          p       LLCI
ULCI
constant     4.5764     1.0276     4.4533      .0000     2.5417
6.6110
AdSyDum     -3.3400     1.7944    -1.8614      .0651    -6.8928
.2127
PRV_Ci3      -.3738      .1633    -2.2893      .0238     -.6970      -
.0505
Int_1        1.2064      .2626     4.5942      .0000      .6865
1.7263
Src_Atra      .3288      .0964     3.4110      .0009      .1379
.5196
Int_2        -.5980      .1752    -3.4135      .0009     -.9448      -
.2511
```

```
Product terms key:
 Int_1    :        AdSyDum  x        PRV_Ci3
 Int_2    :        AdSyDum  x        Src_Atra

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    PRV_Ci3      Int_1   Src_Atra
Int_2
constant     1.0560    -1.0560     -.1487      .1487     -.0404
.0404
AdSyDum     -1.0560     3.2198      .1487     -.4139      .0404     -
.1678
PRV_Ci3      -.1487      .1487      .0267     -.0267     -.0005
.0005
Int_1         .1487     -.4139     -.0267      .0690      .0005
.0042
Src_Atra     -.0404      .0404     -.0005      .0005      .0093     -
.0093
Int_2         .0404     -.1678      .0005      .0042     -.0093
.0307

Test(s) of highest order unconditional interaction(s):
           R2-chng          F        df1        df2          p
X*W          .1255    21.1064     1.0000   120.0000      .0000
X*Z          .0693    11.6520     1.0000   120.0000      .0009
BOTH(X)      .2134    17.9432     2.0000   120.0000      .0000
----------
    Focal predict: AdSyDum  (X)
          Mod var: PRV_Ci3  (W)
          Mod var: Src_Atra (Z)

Conditional effects of the focal predictor at values of the
moderator(s):

    PRV_Ci3   Src_Atra     Effect         se          t          p
LLCI       ULCI
     4.7276     3.1327      .4899      .4695     1.0434      .2988
-.4397     1.4194
     4.7276     4.6760     -.4330      .3649    -1.1868      .2376
-1.1554      .2894
     4.7276     6.2194    -1.3559      .4382    -3.0942      .0025
-2.2235     -.4883
     5.7007     3.1327     1.6638      .3740     4.4490      .0000
.9234     2.4043
     5.7007     4.6760      .7409      .2551     2.9049      .0044
.2359     1.2459
     5.7007     6.2194     -.1820      .3694     -.4926      .6232
-.9133      .5494
     6.6739     3.1327     2.8378      .4358     6.5120      .0000
1.9750     3.7006
     6.6739     4.6760     1.9149      .3572     5.3608      .0000
1.2077     2.6221
     6.6739     6.2194      .9920      .4599     2.1572      .0330
.0815     1.9025

Data for visualizing the conditional effect of the focal predictor:
Paste text below into a SPSS syntax window and execute to produce
plot.

DATA LIST FREE/
   AdSyDum    PRV_Ci3    Src_Atra   Fluency    .
```

```
BEGIN DATA.
      .0000     4.7276     3.1327     3.8394
     1.0000     4.7276     3.1327     4.3292
      .0000     4.7276     4.6760     4.3468
     1.0000     4.7276     4.6760     3.9138
      .0000     4.7276     6.2194     4.8542
     1.0000     4.7276     6.2194     3.4983
      .0000     5.7007     3.1327     3.4756
     1.0000     5.7007     3.1327     5.1395
      .0000     5.7007     4.6760     3.9831
     1.0000     5.7007     4.6760     4.7240
      .0000     5.7007     6.2194     4.4905
     1.0000     5.7007     6.2194     4.3085
      .0000     6.6739     3.1327     3.1119
     1.0000     6.6739     3.1327     5.9497
      .0000     6.6739     4.6760     3.6193
     1.0000     6.6739     4.6760     5.5342
      .0000     6.6739     6.2194     4.1268
     1.0000     6.6739     6.2194     5.1188
END DATA.
GRAPH/SCATTERPLOT=
 PRV_Ci3  WITH     Fluency  BY       AdSyDum  /PANEL   ROWVAR=
Src_Atra .

**********************************************************************
****
OUTCOME VARIABLE:
 Brnd_ATD

Model Summary
          R       R-sq        MSE          F        df1        df2
p
      .3493      .1220     1.6422     8.5468     2.0000   123.0000
.0003

Model
             coeff         se          t          p       LLCI
ULCI
constant     3.2800      .3267    10.0387      .0000     2.6333
3.9268
AdSyDum      -.4834      .2428    -1.9913      .0487     -.9639     -
.0029
Fluency       .2930      .0735     3.9876      .0001      .1476
.4384

Covariance matrix of regression parameter estimates:
           constant    AdSyDum    Fluency
constant      .1068     -.0042     -.0215
AdSyDum      -.0042      .0589     -.0042
Fluency      -.0215     -.0042      .0054

Test(s) of X by M interaction:
          F        df1        df2          p
      .1066     1.0000   122.0000      .7447

****************** DIRECT AND INDIRECT EFFECTS OF X ON Y
*****************

Direct effect of X on Y
     Effect         se          t          p       LLCI       ULCI
     -.4834      .2428    -1.9913      .0487     -.9639     -.0029
```

```
Conditional indirect effects of X on Y:

INDIRECT EFFECT:
 AdSyDum     ->    Fluency     ->    Brnd_ATD

    PRV_Ci3   Src_Atra     Effect     BootSE   BootLLCI   BootULCI
     4.7276     3.1327      .1435      .1528     -.1233      .4758
     4.7276     4.6760     -.1269      .1167     -.3771      .0909
     4.7276     6.2194     -.3973      .1715     -.7684     -.0993
     5.7007     3.1327      .4875      .1645      .2044      .8435
     5.7007     4.6760      .2171      .0887      .0687      .4167
     5.7007     6.2194     -.0533      .1191     -.2903      .1855
     6.6739     3.1327      .8315      .2449      .3841     1.3408
     6.6739     4.6760      .5611      .1770      .2542      .9465
     6.6739     6.2194      .2907      .1679      .0129      .6628

      Indices of partial moderated mediation:
              Index     BootSE   BootLLCI   BootULCI
PRV_Ci3       .3535      .1242      .1337      .6184
Src_Atra     -.1752      .0732     -.3327     -.0484

 Pairwise contrasts between conditional indirect effects (Effect1
minus Effect2)
    Effect1    Effect2   Contrast     BootSE   BootLLCI   BootULCI
     -.1269      .1435     -.2704      .1130     -.5134     -.0748
     -.3973      .1435     -.5408      .2259    -1.0268     -.1495
      .4875      .1435      .3440      .1209      .1301      .6018
      .2171      .1435      .0736      .1338     -.1864      .3481
     -.0533      .1435     -.1968      .2161     -.6558      .1977
      .8315      .1435      .6879      .2418      .2602     1.2037
      .5611      .1435      .4175      .2286      .0227      .9153
      .2907      .1435      .1471      .2676     -.3728      .6961
     -.3973     -.1269     -.2704      .1130     -.5134     -.0748
      .4875     -.1269      .6144      .1919      .2667     1.0191
      .2171     -.1269      .3440      .1209      .1301      .6018
     -.0533     -.1269      .0736      .1338     -.1864      .3481
      .8315     -.1269      .9583      .3002      .4138     1.6105
      .5611     -.1269      .6879      .2418      .2602     1.2037
      .2907     -.1269      .4175      .2286      .0227      .9153
      .4875     -.3973      .8848      .2908      .3627     1.5070
      .2171     -.3973      .6144      .1919      .2667     1.0191
     -.0533     -.3973      .3440      .1209      .1301      .6018
      .8315     -.3973     1.2287      .3838      .5333     2.0381
      .5611     -.3973      .9583      .3002      .4138     1.6105
      .2907     -.3973      .6879      .2418      .2602     1.2037
      .2171      .4875     -.2704      .1130     -.5134     -.0748
     -.0533      .4875     -.5408      .2259    -1.0268     -.1495
      .8315      .4875      .3440      .1209      .1301      .6018
      .5611      .4875      .0736      .1338     -.1864      .3481
      .2907      .4875     -.1968      .2161     -.6558      .1977
     -.0533      .2171     -.2704      .1130     -.5134     -.0748
      .8315      .2171      .6144      .1919      .2667     1.0191
      .5611      .2171      .3440      .1209      .1301      .6018
      .2907      .2171      .0736      .1338     -.1864      .3481
      .8315     -.0533      .8848      .2908      .3627     1.5070
      .5611     -.0533      .6144      .1919      .2667     1.0191
      .2907     -.0533      .3440      .1209      .1301      .6018
      .5611      .8315     -.2704      .1130     -.5134     -.0748
      .2907      .8315     -.5408      .2259    -1.0268     -.1495
      .2907      .5611     -.2704      .1130     -.5134     -.0748
```

*********************** ANALYSIS NOTES AND ERRORS
****

Level of confidence for all confidence intervals in output:
  95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
  5000

W values in conditional tables are the mean and +/- SD from the mean.

Z values in conditional tables are the mean and +/- SD from the mean.

NOTE: Standardized coefficients not available for models with moderators.

------ END MATRIX -----

Appendix J: Ethical Approval

RESEARCH
WITH
PLYMOUTH
UNIVERSITY

Ref: FREC1718.04
Date: 14 December 2017

Dear Shikhar Bhaskar,

Ethical Approval Application No: FREC1718.04
Title: Identifying the factors that inhibit and amplify customer purchase behaviour whilst media multitasking

Thank you for your application to the Faculty Research Ethics Committee (FREC) seeking ethical approval for your proposed research.

The members of the Committee were in agreement that the application was very well presented and carefully addressed the key issues in addition to identifying potential research related ethics and how they would be managed. We are therefore happy to approve your application.

With reference to section 10 (g), the proposed research may fall under the remit of one or more professional code of ethics, such as, Social Research Association:

http://www.the-sra.org.uk/ethical.htm

or Market Research Society:

http://www.mrs.org.uk/standards/codeconduct.htm.

It would therefore be useful to also consult such professional code of ethics before you commence your data collection activities.

The FREC members wish you every success with your research.

Yours sincerely
(Sent as email attachment)

Dr James Benhin
Chair
Faculty Research Ethics Committee, Faculty of Business

Faculty of Business
University of Plymouth
Drake Circus
Plymouth
Devon PL4 8AA United Kingdom

T +44 (0) 1752 585540
F +44 (0) 1752 585715
W www.plymouth.ac.uk

UNIVERSITY OF PLYMOUTH
Faculty of Business

Date: 03 May 2019

Dear Shikhar,

Ethical Approval Application No: FREIC1819.26
Title: The role of self-control in explaining the advertising outcomes

Thank you for your application to the Faculty Research Ethics & Integrity Committee (FREIC) seeking ethical approval for your proposed research.

The committee has considered your revised application and is fully satisfied that the project complies with Plymouth University's ethical standards for research involving human participants.

Approval is for the duration of the project. However, please resubmit your application to the committee if the information provided in the form alters or is likely to alter significantly.

The FREIC members wish you every success with your research.

Yours sincerely
(Sent as email attachment)

Mr Derek Shepherd
Chair
Faculty Research Ethics & Integrity Committee
Faculty of Business

Derek Shepherd, Chair, Faculty Research Ethics & Integrity Committee, Faculty of Business, Cookworthy, University of Plymouth, Drake Circus, Devon PL4 8AA, United Kingdom
T +44(0)1752 585587 E FoBResearch@plymouth.ac.uk W www.plymouth.ac.uk

UNIVERSITY OF PLYMOUTH
Faculty of Arts and Humanities

Date: 20 December 2019

Dear Shikhar,

Ethical Approval Application No: FREIC1920.06
Title: Message Fit: Synchronisation of message during media multitasking and its effects

Thank you for your application to the Faculty Research Ethics & Integrity Committee (FREIC) seeking ethical approval for your proposed research.

The committee has considered your revised application and is fully satisfied that the project complies with Plymouth University's ethical standards for research involving human participants.

Approval is for the duration of the project. However, please resubmit your application to the committee if the information provided in the form alters or is likely to alter significantly.

The FREIC members wish you every success with your research.

Yours sincerely
(Sent as email attachment)

Mr Derek Shepherd
Chair
Faculty Research Ethics & Integrity Committee
Faculty of Arts & Humanities (SoLCG & PBS)

Derek Shepherd, Chair, Faculty Research Ethics & Integrity Committee, Faculty of Arts & Humanities (SoLCG & PBS),
Roland Levinsky Building, University of Plymouth, Drake Circus, Devon PL4 8AA, United Kingdom
T +44(0)1752 585587 E FoAHSocSciResearch@plymouth.ac.uk W www.plymouth.ac.uk

Bibliography

Adler, R.F. and Benbunan-Fich, R. 2015. The Effects of Task Difficulty and Multitasking on Performance. *Interacting with Computers* 27(4), pp. 430–439.

Ahn, J. & La Ferla, C., 2008. Enhancing Recall and Recognition for Brand Names and Body Copy. *Journal of Advertising,* 37(3), pp. 107-117.

Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. London, UK: Sage

Alpert, F.H. and Kamins, M.A., 1995. An empirical investigation of consumer memory, attitude, and perceptions toward pioneer and follower brands. *Journal of Marketing*, *59*(4), pp.34-45.

Alter, A.L. and Oppenheimer, D.M. 2009. Uniting the Tribes of Fluency to Form a Metacognitive Nation. *Personality and Social Psychology Review* 13(3), pp. 219–235.

Amazing Places on Our Planet. (2015). New York City Skyline in 4K (Ultra HD). [Online Video]. 22 December 2015. Available from: https://www.youtube.com/watch?v=yKk3WDSFOos&t=179s. [Accessed: 25 April 2018].

Andrews, J. and Shrimp, T. 2018. Advertising, Promotion and other aspects of Integrated Marketing Communications. 10th Edition. Boston. Cengage.

Angell, R., Bottomley, P., Brečić, R., Filipović, J., Gorton, M., Logkizidou, M. and White, J., 2020. Configuring perceived fit to mitigate consumer animosity in the context of cross-border sport sponsorships. *European Sport Management Quarterly*, pp.1-20.

Angell, R., Gorton, M., Sauer, J., Bottomley, P. and White, J., 2016. Don't distract me when I'm media multitasking: Toward a theory for raising advertising recall and recognition. *Journal of Advertising*, *45*(2), pp.198-210.

Armstrong, B. G. & Chung, L., 2000. Background television and reading memory in context: Assessing TV interference and facilitative context effects on encoding versus retrieval processes.. Communication Research, 27(3), pp. 327-352.

Armstrong, G.B. and Sopory, P. 1997. Effects of Background Television on Phonological and Visuo-Spatial Working Memory. Communication Research 24 (5), pp 459-480.

Armstrong, G.B., Boiarsky, G.A. and Mares, M.L., 1991. Background television and reading performance. *Communications Monographs*, *58*(3), pp.235-253.

Assael, H., 2011. From silos to synergy: a fifty-year review of cross-media research shows synergy has yet to achieve its full potential. *Journal of Advertising Research*, *51*(1 50th Anniversary Supplement), pp.42-58.

Audiffren, M., Tomporowski, P.D. and Zagrodnik, J., 2008. Acute aerobic exercise and information processing: energizing motor processes during a choice reaction time task. *Acta Psychologica*, *129*(3), pp.410-419.

Auxier, B., Rainie, L., Anderson, M., Perrin, A., Kumar, M., Turner, E. 2019. Americans and Privacy: Concerned, Confused and Feeling Lack of Control Over Their Personal Information. Availabe at: https://www.pewresearch.org/internet/2019/11/15/americans-and-privacy-concerned-confused-and-feeling-lack-of-control-over-their-personal-information/ [Accessed: 26 March 2021]

Baddeley, A., 1997. Human memory: Theory and practice. Hove, England: Psychology Press.

Baek, T.H. and Morimoto, M., 2012. Stay away from me. *Journal of advertising*, *41*(1), pp.59-76.

Bansal, G. et al. 2015. The role of privacy assurance mechanisms in building trust and the moderating role of privacy concern. *European Journal of Information Systems* 24(6), pp. 624–644.

Barden, J. and Petty, R.E. 2008. The mere perception of elaboration creates attitude certainty: Exploring the thoughtfulness heuristic. *Journal of Personality and Social Psychology* 95(3), pp. 489–509.

Baron, R.M. and Kenny, D.A., 1986. The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology*, *51*(6), p.1173.

Batra, R. and Aaker, D. A. 1996. Advertising Management. New Jersey. Prentice Hall.

Batra, R. and Ray, M.L., 1986. Affective responses mediating acceptance of advertising. *Journal of consumer research*, *13*(2), pp.234-249.

Baumeister, R. F., Bratslavsky, E., Muraven, M. & Tice, D. M., 1998. Ego Depletion: Is the Active Self a Limited resource. *Journal of Personality and Soical Psychology*, 74(5), pp. 1252-1265.

BBC (2019). Love Island ratings hit record high. *BBC News* 15 July. Available at: https://www.bbc.com/news/entertainment-arts-48991692 [Accessed: 19 June 2020].

BBC News 2010. Britons 'multitask' with media. 19 August. Available at: https://www.bbc.com/news/technology-11012356 [Accessed: 22 June 2020].

Bechtoldt, M.N. et al. 2010. Motivated information processing, social tuning, and group creativity. *Journal of Personality and Social Psychology* 99(4), pp. 622–637.

Bednarik, R. and Tukiainen, M., 2004, October. Visual attention tracking during program debugging. In *Proceedings of the third Nordic conference on Human-computer interaction* (pp. 331-334).

Beeftink, B. 2019. *Where have all our audiences gone?* Mediatel News. Available at: https://mediatel.co.uk/news/2019/09/12/where-have-all-our-audiences-gone [Accessed: 21 April 2021]

Begg, I.M., Anas, A. and Farinacci, S., 1992. Dissociation of processes in belief: Source recollection, statement familiarity, and the illusion of truth. *Journal of Experimental Psychology: General*, *121*(4), p.446.

Bellman , S., Jennifer, R. A., Brooke, W. & Varan, D., 2014. The Effects of Social TV on Television Advertising Effectiveness. Journal of MArketing Communication, pp. 1-19.

Bellman, S., Rossiter, J. R., Schweda, A. & Varan, D., 2012. How Coviewing reduces the effectiveness of Tv Advertising. Journal of Marketing Communication, 18(5), pp. 363-78.

Bennett, C.J., 2011. In defense of privacy: the concept and the regime. *Surveillance & Society*, *8*(4), pp.485-496.

Biswas, D., Labrecque, L. I., Lehmann, D. R., & Markos, E. (2014). 'Making Choices While Smelling, Tasting, and Listening: The Role of Sensory (Dis)similarity When Sequentially Sampling Products', *Journal of Marketing*, 78/1: 112–26

Sophie C. Boerman, Eva A. van Reijmersdal & Peter C. Neijens (2015) Using Eye Tracking to Understand the Effects of Brand Placement Disclosure Types in Television Programs, *Journal of Advertising*, 44:3, 196-207

Bolls, P.D. and Muehling, D.D., 2007. The effects of dual-task processing on consumers' responses to high-and low-imagery radio advertisements. *Journal of Advertising*, *36*(4), pp.35-47.

Bornstein, R.F. and D'Agostino, P.R., 1994. The attribution and discounting of perceptual fluency: Preliminary tests of a perceptual fluency/attributional model of the mere exposure effect. *Social Cognition*, *12*(2), pp.103-128.

Bornstein, R.F., 1989. Exposure and affect: overview and meta-analysis of research, 1968–1987. *Psychological bulletin*, *106*(2), p.265.

Bornstein, Robert F, and Paul R., D'Agostino 1992. The Attribution and Discounting of Perceptual Fluency: Preliminary Tests of a Perceptual Fluency/Attributional Model of the Mere Exposure Effect, Social Cognition, 12 (Summer), 103–128

Bower, A. B., & Landreth, S. 2001. Is Beauty Best? Highly versus Normally Attractive Models in Advertising, *Journal of Advertising*, 30/1: 1–12

Bradley, M. M. & Lang, P. J., 1999. Affective norms for English words (ANEW): Instruction manual and affective ratings, University of Florida: The Center for Research in Psychophysiology.

Brancato, G., Macchia, S., Murgia, M., Signore, M., Simeoni, G., Blanke, K. and Hoffmeyer-Zlotnik, J., 2006. Handbook of recommended practices for questionnaire development and testing in the European statistical system. *European Statistical System*.

Brand Finance. 2018. *Football 50 (2018): The Annual Report on the Most Valuable Football Brands*. Available at: https://brandfinance.com/wp-content/uploads/1/brand_finance_football_50_report_2018.pdf [Accessed: 20 April 2021]

Brasel, S.A. and Gips, J., 2011. Media multitasking behavior: Concurrent television and computer usage. *Cyberpsychology, Behavior, and Social Networking*, *14*(9), pp.527-534.

Brehm, J.W. et al. 1983. Perceived difficulty, energization, and the magnitude of goal valence. *Journal of Experimental Social Psychology* 19(1), pp. 21–48.

Brennan, I., & Babin, L. A. (2004). 'Brand Placement Recognition: The Influence of Presentation Mode and Brand Familiarity', *Journal of Promotion Management*, 10/1–2: 185–202.

Briñol, P. and Petty, R.E., 2008. Embodied persuasion: Fundamental processes by which bodily responses can impact attitudes. *Embodiment grounding: Social, cognitive, affective, and neuroscientific approaches*, pp.184-207.

Broadbent, D.E. (1958). Perceptions and Communication. Oxford. Pergamon Press.

Broeker, L. et al., 2017. Multitasking as a choice: a perspective. Psychological Research.

Bryant, Jennings, and Paul W. Comisky (1978), 'The Effect of Positioning a Message with Differentially Cognitively Involving Portions of a Television Segment on Recall of the Message', *Human Communication Research*, 5 (1), 63–75.

Bryman, A., 2016. *Social research methods*. London. Oxford university press.

Buser, T. and Peter, N. 2012. Multitasking. *Experimental Economics* 15(4), pp. 641–655.

Cacioppo, J.T., Petty, R.E. and Feng Kao, C., 1984. The efficient assessment of need for cognition. *Journal of personality assessment*, *48*(3), pp.306-307.

Cacioppo, J.T., Petty, R.E., Kao, C.F. and Rodriguez, R., 1986. Central and peripheral routes to persuasion: An individual difference perspective. *Journal of personality and social psychology*, *51*(5), p.1032.

Campaign India. 2020. *Indian sports sponsorship reached Rs 9,109 crore in 2019: GroupM report.* Available at: https://www.campaignindia.in/article/indian-sports-sponsorship-reached-rs-9-109-crore-in-2019-groupm-report/458747 [Accessed at: 14 April 2021]

Campbell, M.C. and Kirmani, A. 2000. Consumers' Use of Persuasion Knowledge: The Effects of Accessibility and Cognitive Capacity on Perceptions of an Influence Agent. *Journal of Consumer Research* 27(1), pp. 69–83.

Carter, A.R., Gill, D., Davies, N.M., Taylor, A.E., Tillmann, T., Vaucher, J., Wootton, R.E., Munafò, M.R., Hemani, G., Malik, R. and Seshadri, S., 2019. Understanding the consequences of education inequality on cardiovascular disease: mendelian randomisation study. *bmj*, *365*.

Cassidy, B.S., Boucher, K.L., Lanie, S.T. and Krendl, A.C., 2019. Age effects on trustworthiness activation and trust biases in face perception. *The Journals of Gerontology: Series B*, *74*(1), pp.87-92.

Chae, S.W. et al. 2015. Task difficulty and team diversity on team creativity: Multi-agent simulation approach. *Computers in Human Behavior* 42, pp. 83–92.

Chaiken, S. and Maheswaran, D., 1994. Heuristic processing can bias systematic processing: effects of source credibility, argument ambiguity, and task importance on attitude judgment. *Journal of personality and social psychology*, *66*(3), p.460.

Chaiken, S., 1980. Heuristic versus systematic information processing and the use of source versus message cues in persuasion. *Journal of personality and social psychology*, *39*(5), p.752.

Chang, Y. and Thorson, E., 2004. Television and web advertising synergies. *Journal of advertising*, *33*(2), pp.75-84.

Chatterjee, P. (2011). The role of varying information quantity in ads on immediate and enduring cross-media synergies. *Journal of Marketing Communications*, pp. 1–24.

Chellappa, R.K. and Sin, R.G., 2005. Personalization versus privacy: An empirical examination of the online consumer's dilemma. *Information technology and management*, *6*(2), pp.181-202.

Chinchanachokchai, S., Duff, B.R. and Sar, S., 2015. The effect of multitasking on time perception, enjoyment, and ad evaluation. *Computers in Human Behavior*, *45*, pp.185-191.

Cho, L. 2020. *Women or Men — Who Has a Higher Risk of Heart Attack? How gender is involved in coronary artery disease.* Available at: https://health.clevelandclinic.org/women-men-higher-risk-heart-attack/ [Accessed at: 14 April 2021]

Chung, J. & Monroe, G. S., 2000. The Effects of Experience and Task Difficulty on Accuracy and Confidence Assessments of Auditors. Accounting and Finance, Volume 40, pp. 135-152.

Cialdini, R.B., 2007. *Influence: The psychology of persuasion* (Vol. 55, p. 339). New York: Collins.

Cialdini, R.B., Petty, R.E. and Cacioppo, J.T., 1981. Attitude and attitude change. *Annual review of psychology*, *32*(1), pp.357-404.

Clark, C.E., Campbell, J.L., Evans, P.H. and Millward, A., 2006. Prevalence and clinical implications of the inter-arm blood pressure difference: a systematic review. *Journal of human hypertension*, *20*(12), pp.923-931.

Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*. New York, USA: Routledge comScore. 2020. *Extent of Ad Avoidance – How Big a Problem Is It?.* Available at: https://cdn.thearf.org/ARF_Knowledgebase/ARF%20Member%20Only%20Events/2018.4.19_AD-AVOIDANCExSCIENCE/1_AD-AVOIDANCExSCIENCE_Extent-of-ad-avoidance_Chasin.pdf [Accessed: 22 April 2021]

Cowley, E., & Barron, C. (2008). 'When Product Placement Goes Wrong: The Effects of Program Liking and Placement Prominence', *Journal of Advertising*, 37/1: 89–98.

Crites, Stephen L., Leandre R. Fabrigar, and Richard E. Petty (1994),'Measuring the Affective and Cognitive Properties of Attitudes: Conceptual and Methodological Issues,' *Personality and Social Psychology Bulletin*, 20 (6), 619–34.

Dahlén, M. 2005. THE MEDIUM AS A CONTEXTUAL CUE: Effects of Creative Media Choice. *Journal of Advertising* 34(3), pp. 89–98.

Dahlén, M. et al. 2008. Could Placing Ads Wrong Be Right? Advertising Effects of Thematic Incongruence. *Journal of Advertising* 37(3), pp. 57–67.

Dalmaijer, Edwin S., Sophie G. Gibbons, Giacomo Bignardi, Alexander L. Anwyl-Irvine, Roma Siugzdaite, Tess A. Smith, Stepheni Uh, et al. 2019. "Direct and Indirect Links Between Children's Socio-economic Status and Education: Pathways via Mental Health, Attitude, and Cognition." PsyArXiv. December 6.

Damos, D. L. (1997). Using interruptions to identify task prioritization in Part 121 air carrier operations. In R. Jensen (Ed.), Proceedings of the 9th International Symposium on Aviation Psychology. Columbus, OH: Ohio State University.

Davis, M.J., 2010. Contrast coding in multiple regression analysis: Strengths, weaknesses, and utility of popular coding structures. *Journal of Data Science*, *8*(1), pp.61-73.

Davranche, K., Burle, B., Audiffren, M. and Hasbroucq, T., 2005. Information processing during physical exercise: a chronometric and electromyographic study. *Experimental Brain Research*, *165*(4), pp.532-540.

de Gregorio, F., & Sung, Y. (2010). 'Understanding Attitudes Toward and Behaviors in Response to Product Placement', *Journal of Advertising*, 39/1: 83–96.

de Oliveira, R. F., Raab, M., Hegele, M. & Schorer, J., 2017. Task Integration Facilitates Multitasking. *Frontiers in Psychology*, Volume 8, p. 398

DeBono, K.G. and Harnish, R.J., 1988. Source expertise, source attractiveness, and the processing of persuasive information: A functional approach. *Journal of Personality and social Psychology*, *55*(4), p.541.

Deloitte, 2017. State Of The Smart: Global Mobile Consumer Survey 2017: UK Cut, London:

Deloitte. 2015. *Digital Democracy Survey A multi-generational view of consumer technology, media and telecom trends.* Available at: https://www2.deloitte.com/content/dam/Deloitte/za/Documents/technology-mediatelecommunications/ZA_Deloitte_Digital_Democracy_Survey_Final.pdf [Accessed 21 April 2021]

DeRosia, E. D. 2008. The effectiveness of nonverbal symbolic signs and metaphors in advertisements: An experimental inquiry. *Psychology & Marketing*, **25**, 298– 316.

Dietrich, A. and Sparling, P.B., 2004. Endurance exercise selectively impairs prefrontal-dependent cognition. *Brain and cognition*, *55*(3), pp.516-524.

Dijkstra, M. et al. 2005. Separate and joint effects of medium type on consumer responses: a comparison of television, print, and the Internet. *Journal of Business Research* 58(3), pp. 377–386.

Dragojevic, M., & Giles, H. 2016. 'I Don't Like You Because You're Hard to Understand: The Role of Processing Fluency in the Language Attitudes Process: Processing Fluency and Language Attitudes', *Human Communication Research*, 42/3: 396–420.

Duff, B.R.-L. and Sar, S. 2015. Seeing the Big Picture: Multitasking and Perceptual Processing Influences on Ad Recognition. *Journal of Advertising* 44(3), pp. 173–184.

Duffy, E. 1962. *Activation and behavior.* London. Wiley

Durko, A. M. & Petrick, J. F., 2016. Travel as Relationship Therapy: Examining the Effect of Vacation Satisfaction Applied to the Investment Model. Journal of Travel Research, 55(7), pp. 904-918.

Easterbrook, J.A., 1959. The effect of emotion on cue utilization and the organization of behavior. *Psychological review*, *66*(3), p.183.

Education First. 2019. English Proficiency Index. . Available at: https://www.ef.com/wwen/epi/ [Accessed: 20 April 2021]

Egan, J. 2007. Marketing Communications. London. Thomson.

Eliav, E. and Miron-Spektor, E. 2015. The Recovery Effect: The Creative Potential of Frequent Interruptions. *Academy of Management Proceedings* 2015(1), p. 18083. doi: 10.5465/ambpp.2015.229.

Elsen, M., Pieters, R. and Wedel, M., 2016. Thin slice impressions: How advertising evaluation depends on exposure duration. *Journal of Marketing Research*, *53*(4), pp.563-579.

eMarketer. (2018). Mobile advertising is expected to surpass TV ad spending. Retrieved from https://www.emarketer.com/content/mobile-advertising-is-expected-to-surpass-tv-ad-spending

Enns, J.T. and MacDonald, S.C., 2013. The role of clarity and blur in guiding visual attention in photographs. *Journal of Experimental Psychology: Human Perception and Performance*, *39*(2), p.568.

Eysenck, H.J., Nias, D.K.B. and Cox, D.N., 1982. Sport and personality. *Advances in behaviour research and therapy*, *4*(1), pp.1-56.

Fang, X., Singh, S. and Ahluwalia, R., 2007. An examination of different explanations for the mere exposure effect. *Journal of consumer research*, *34*(1), pp.97-103.

Ferraro, R., & Avery, R. J. 2000. 'Brand Appearances on Prime-Time Television', *Journal of Current Issues & Research in Advertising*, 22/2: 1–15

Field, A., 2013. *Discovering statistics using IBM SPSS statistics*. London. Sage.

FIFA. 2018. More than half the world watched record-breaking 2018 World Cup. Available at: https://www.fifa.com/worldcup/news/more-than-half-the-world-watched-record-breaking-2018-world-cup [Accessed: 20 April 2020]

Fransen, M.L., Fennis, B.M. and Pruyn, A.T.H., 2010. Matching communication modalities: The effects of modality congruence and processing style on brand evaluation and brand choice. *Communication research*, *37*(4), pp.576-598.

Fransen, Marieke L., Bob M. Fennis, and Ad Th.H. Pruyn. 2010, "Matching Communication Modalities: The Effects of Modality Congruence and Processing Style on Brand Evaluation and Brand Choice," *Communication Research*, 37 (4), 576–98

Fox, J. (1997). *Applied Regression Analysis, Linear Models, and Related Methods*. Sage Publications.

Galician, M.-L., & Bourdeau, P. G. 2004. 'The Evolution of Product Placements in Hollywood Cinema: Embedding High-Involvement "Heroic" Brand Images', *Journal of Promotion Management*, 10/1–2: 15–36.

Gangadgarbatla, H., Bradley, S. & Wise, W., 2013. Psychophysiological Responses to Background Brand Placements in Video Games. *Journal of Advertising,* 42(2-3), pp. 251-263.

Garaus, M., Wagner, U. and Bäck, A.M., 2017. The effect of media multitasking on advertising message effectiveness. *Psychology & Marketing*, *34*(2), pp.138-156.

Garner, W.R. 2014. *The processing of information and structure*. New York; London: Psychology Press. Available at: https://www.taylorfrancis.com/books/e/9781317769828 [Accessed: 11 September 2020].

Garretson, J.A. and Niedrich, R.W., 2004. Spokes-characters: Creating character trust and positive brand attitudes. *Journal of advertising*, *33*(2), pp.25-36.

Gerritsen, M. et al., 2010. English in Product Advertisement in Non-English-Speaking Countries in Western Europe: Product Image and Comprehension of the Text. Journal of Global Marketing, 23(4), pp. 349-365.

Gerritsen, M. et al., 2010. English in Product Advertisement in Non-English-Speaking Countries in Western Europe: Product Image and Comprehension of the Text. *Journal of Global Marketing,* 23(4), pp. 349-365.

Geuens, M. and De Pelsmacker, P., 2017. Planning and conducting experimental advertising research and questionnaire design. *Journal of Advertising*, *46*(1), pp.83-100.

Gilbert, D.T., Pelham, B.W. and Krull, D.S., 1988. On cognitive busyness: When person perceivers meet persons perceived. *Journal of personality and social psychology*, *54*(5), p.733.

Gillespie, B., Joireman, J. and Muehling, D.D., 2012. The moderating effect of ego depletion on viewer brand recognition and brand attitudes following exposure to subtle versus blatant product placements in television programs. *Journal of Advertising*, *41*(2), pp.55-66.

Gillespie, B., Joireman, J. and Muehling, D.D., 2012. The moderating effect of ego depletion on viewer brand recognition and brand attitudes following exposure to subtle versus blatant product placements in television programs. *Journal of Advertising*, *41*(2), pp.55-66.

Godwin, R. 2019. The age of comfort TV: why people are secretly watching Friends and The Office on a loop. Available at: https://www.theguardian.com/tv-and-radio/2019/aug/21/the-age-of-comfort-tv-why-people-are-secretly-watching-friends-and-the-office-on-a-loop [Accessed at: 27 February 2021]

Goldstein, A.G. and Chance, J.E. 1980. Memory for Faces and Schema Theory. *The Journal of Psychology* 105(1), pp. 47–59. doi: 10.1080/00223980.1980.9915131.

Goldstein, A.G. and Chance, J.E., 1980. Memory for faces and schema theory. *The journal of psychology*, *105*(1), pp.47-59.

Grandoni, D. (2014). REVEALED: The Secret Behind BuzzFeed's Quizzes. Available at: https://www.huffpost.com/entry/buzzfeed-quiz-how-do-they-work_n_4810992 [Accessed: 19 June 2020].

Grossman, A., Prokupetz, A., Gordon, B., Morag-Koren, N. and Grossman, E., 2013. Inter-arm blood pressure differences in young, healthy patients. *The Journal of Clinical Hypertension*, *15*(8), pp.575-578.

Gupta, P.B. and Gould, S.J., 1997. Consumers' perceptions of the ethics and acceptability of product placements in movies: Product category and individual differences. *Journal of Current Issues & Research in Advertising*, *19*(1), pp.37-50.

Guttmann, A. 2019a. Global Advertising Market – Statistics and Facts. Available at https://www.statista.com/topics/990/global-advertising-market/ [Accessed: 11 September 2020]

Guttmann, A. 2019b. Global sponsorship spending from 2007 to 2018. Available at: https://www.statista.com/statistics/196864/global-sponsorship-spending-since-2007/ [Accessed: 20 April 2021]

Guttmann, A. 2020. Advertising spending in the world's largest ad markets 2019. Available at: https://www.statista.com/topics/1747/advertising-in-the-united-kingdom/ [Accessed at: 27 February 2021]

Guttmann, A. 2020a. Advertising spending in the United Kingdom (UK) 1999-2019, by media. Available at: https://www.statista.com/statistics/248766/advertising-spending-in-the-uk-by-media/ [Accessed at: 27 February 2021]

Guttmann, A. 2021. *Net advertising spending in the United Kingdom (UK) from 2012 to 2024.* Available at: https://www.statista.com/statistics/248766/advertising-spending-in-the-uk-by-media/ [Accessed: 20 April 2021]

Gwizdka, J., 2010. Distribution of cognitive load in web search. *Journal of the American Society for Information Science and Technology*, *61*(11), pp.2167-2187.

Hamann, S.B., 1990. Level-of-processing effects in conceptually driven implicit tasks. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *16*(6), p.970.

Handley, 2016. *Global advertising spend to slow in 2017, while 2016 sales reached nearly $500bn: Research.* Available at: https://www.cnbc.com/2016/12/05/global-ad-spend-to-slow-in-2017-while-2016-sales-were-nearly-500bn.html [Accessed: 20 April 2021]

Harkins, S.G. and Petty, R.E., 1981. The multiple source effect in persuasion: The effects of distraction. *Personality and Social Psychology Bulletin*, *7*(4), pp.627-635.

Hart, S.G. and Staveland, L.E., 1988. Development of NASA-TLX (Task Load Index): Results of empirical and theoretical research. In *Advances in psychology* (Vol. 52, pp. 139-183). North-Holland.

Hastie, R. and Park, B., 1986. The relationship between memory and judgment depends on whether the judgment task is memory-based or on-line. *Psychological review*, *93*(3), p.258.

Hayes, A.F., 2013. *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. New York, NY.Guilford Press.

Haynam, J. 2015. What Makes BuzzFeed Quizzes So Popular? - Business 2 Community. Available at: https://www.business2community.com/social-media/makes-buzzfeed-quizzes-popular-01335537 [Accessed: 19 June 2020].

Heather, N. (1976). *Radical Perspectives in Psychology*. London: Methuen.

Heckler, S.E. and Childers, T.L. 1992. The Role of Expectancy and Relevancy in Memory for Verbal and Visual Information: VVhatlslncongruency? *JOURNAL OF CONSUMER RESEARCH* , p. 18.

Heckler, S.E. and Childers, T.L., 1992. The role of expectancy and relevancy in memory for verbal and visual information: what is incongruency?. *Journal of consumer research*, *18*(4), pp.475-492.

HESA. 2019. *Who's studying in HE?*. Cheltenham. HESA. Available at: https://www.hesa.ac.uk/data-and-analysis/students/whos-in-he [Accessed: 19 June 2020].

Homer, P. M. 2009. 'Product Placements', *Journal of Advertising*, 38/3: 21–32

Hovland, C.I., Janis, I.L., & Kelley, H.H. 1953. *Communication and persuasion.* London. Yale University Press

Huang, G. and Li, H. 2016, Understanding Media Synergy, De Pelsmacker, P. (Ed.) *Advertising in New Formats and Media*, Emerald Group Publishing Limited, Bingley, pp. 97-113.

Humphreys, M.S. and Revelle, W., 1984. Personality, motivation, and performance: a theory of the relationship between individual differences and information processing. *Psychological review*, *91*(2), p.153.

Hutcheson, G.D. and Sofroniou, N., 1999. *The multivariate social scientist: Introductory statistics using generalized linear models*. New York, USA: Sage.

iTV (2020). ITV Product Placement. Available at: https://www.itvmedia.co.uk/advertising-on-itv/licensing/itv-product-placement [Accessed: 19 June 2020].

Jacoby, L. L., 1991. A Process Dissociation Framework: Separating Automatic from Intentional Uses of Memory. *Journal of Memory and Language,* Volume October, pp. 513-541.

Jacoby, L.L. and Dallas, M. 1981. On the Relationship Between Autobiographical Memory and Perceptual Learning., p. 35.

Jagre, E., Watson, J.J. and Watson, J.G., 2001. Sponsorship and congruity theory: A theoretical framework for explaining consumer attitude and recall of event sponsorship. *ACR North American Advances*.

James, W. 1890. Principles of psychology. New York: Holt. (Reprinted in 1983 by Harvard University Press). Available online at http://psychclassics.yorku.ca/James/Principles/ [Accessed: 20 April 2021]

Janiszewski, C. and Meyvis, T., 2001. Effects of brand logo complexity, repetition, and spacing on processing fluency and judgment. *Journal of consumer research*, *28*(1), pp.18-32.

Janiszewski, C., 1993. Preattentive mere exposure effects. *Journal of Consumer Research*, *20*(3), pp.376-392.

Jeong, S.-H. & Fishbein, M., 2007. Predictors of Multitasking with Media: Media Factors and Audience Factors. Media Psychology, 10(3), pp. 364-384.

Jeong, S.-H. & Hwang, Y., 2016. Media Multitasking Effects on Cognitive vs Attitudinal Outcomes: A Meta Analysis. Human Communication Research, Volume 42, pp. 599-618.

Jeong, S.-H. and Hwang, Y. 2012. Does Multitasking Increase or Decrease Persuasion? Effects of Multitasking on Comprehension and Counterarguing. *Journal of Communication* 62(4), pp. 571–587.

Jeong, S.-H. and Hwang, Y. 2015. Multitasking and Persuasion: The Role of Structural Interference. *Media Psychology* 18(4), pp. 451–474.

Jeong, Y. and Coyle, E., 2014. What are you worrying about on Facebook and Twitter? An empirical investigation of young social network site users' privacy perceptions and behaviors. *Journal of Interactive Advertising*, *14*(2), pp.51-59.

Jin, H. S., Suh, J. & Donavan, D., 2008. Salient Effects of Publicity in Advertsised Brand Recall and Recognition: The List-Strength Paradigm. Journal of Advertising, 37(1), pp. 45-57.

Jin, H.S., Suh, J. and Donavan, D.T., 2008. Salient effects of publicity in advertised brand recall and recognition: The list-strength paradigm. *Journal of Advertising*, *37*(1), pp.45-57.

Johnson, J. 2020. Top Gear: monthly reach by demographic UK 2019-2020. Available at: https://www-statista-com.plymouth.idm.oclc.org/statistics/381733/bbc-top-gear-monthly-reach-by-demographic-uk/ [Accessed: 20 August 2020].

Johnson, J. 2021. Internet users time spent online 2013-2019, by device. Available at: https://www.statista.com/statistics/1036680/internet-users-online-time-spent-mobile-pc-device/ [Accessed: 22 March 2021]

Johnston, W.A., Dark, V.J. and Jacoby, L.L., 1985. Perceptual fluency and recognition judgments. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *11*(1), p.3.

Jung, A.R., 2017. The influence of perceived ad relevance on social media advertising: An empirical examination of a mediating role of privacy concern. *Computers in Human Behavior*, *70*, pp.303-309.

Kahle, L.R. and Homer, P.M., 1985. Physical attractiveness of the celebrity endorser: A social adaptation perspective. *Journal of consumer research*, *11*(4), pp.954-961.

Kahle, Lynn R. 1984. *Attitudes and Social Adapation: A Person Situation Interaction Approach*, Oxford: Permagon.

Kahle, Lynn R. and Timmer, Susan Goff. 1983. A Theory and a Method for Studying Values. In *Social Values and Social Change: An Adaptation to Life in America*, Edited by: Kahle, Lynn R. New York: Praeger.

Kahneman, 2011. *Thinking, Fast and Slow.* New York. Farrar, Straus and Giroux.

Kahneman, D., 1973. Attention and Effort. Englewoods Cliffs, (NJ): Hemel Hapstead.

Kaiser, H. F. (1974). 'An index of factorial simplicity', *Psychometrika*, 39/1: 31–36. New York, USA: Springer.

Kantrowitz, A. 2014. Look at your phone during TV ads? Expect to see the same messages there. Available at: https://adage.com/article/digital/wpp-s-xaxis-sync-tv-mobile-ads/292758 [Accessed: 2 April 2021]

Kapadia, C. 2016. Doing More in Less Time: How Multitasking Increases Creativity. *Academy of Management Proceedings* 2016(1), p. 17543.

Kardes, F.R., Kalyanaram, G., Chandrashekaran, M. and Dornoff, R.J., 1993. Brand retrieval, consideration set composition, consumer choice, and the pioneering advantage. *Journal of Consumer Research*, *20*(1), pp.62-75.

Kazakova, S., Cauberghe, V., Hudders, L. and Labyt, C., 2016. The impact of media multitasking on the cognitive and attitudinal responses to television commercials: The moderating role of type of advertising appeal. *Journal of Advertising*, *45*(4), pp.403-416.

Kazakova, S., Cauberghe, V., Pandelaere, M. and De Pelsmacker, P., 2015. Can't see the forest for the trees? The effect of media multitasking on cognitive processing style. *Media psychology*, *18*(4), pp.425-450.

Keelery, S. 2020. *Number of social network users India 2015-2023.* Available at: https://www.statista.com/statistics/278407/number-of-social-network-users-in-india/ [Accessed at: 14 April 2021]

Keller, K.L. 1987. Memory Factors in Advertising: The Effect of Advertising Retrieval Cues on Brand Evaluations. *Journal of Consumer Research* 14(3), pp. 316–333.

Kent, R.J., 1993. Competitive versus non competitive clutter in television advertising. *Journal of Advertising Research*, *33*(2), pp.40-47.

Kim, J.I. and Humphreys, G.W. 2010. Working memory, perceptual priming, and the perception of hierarchical forms: Opposite effects of priming and working memory without memory refreshing. *Attention, Perception, & Psychophysics* 72(6), pp. 1533–1555..

Kool, W., McGuire, J.T., Rosen, Z.B. and Botvinick, M.M., 2010. Decision making and the avoidance of cognitive demand. *Journal of experimental psychology: general*, *139*(4), p.665.

Kotler, P. and Armstrong, G. 2018. Principles of Marketing. 17th Edition. Harlow, UK. Pearson.

KPMG. 2016. *The Business of Sports. Playing to win as the game unfurls.* Delhi. Available at: https://assets.kpmg/content/dam/kpmg/in/pdf/2016/09/the-business-of-sports.pdf [Accessed at: 14 April 2021]

Kurilla, B.P. and Westerman, D.L. 2008. Processing fluency affects subjective claims of recollection. *Memory & Cognition* 36(1), pp. 82–92.

Kyte, M. 2019. Coupling up with Love Island can boost a brand | YouGov. Available at: https://yougov.co.uk/topics/media/articles-reports/2019/07/26/coupling-love-island-boosts-brands-perception [Accessed: 19 June 2020].

La Ferle, C., & Edwards, S. M. 2006. 'Product Placement: How Brands Appear on Television', *Journal of Advertising*, 35/4: 65–86.

Labroo, A. A., & Lee, A. Y. 2018. Between Two Brands: A Goal Fluency Account of Brand Evaluation, *Journal of Marketing Research*. SAGE PublicationsSage CA: Los Angeles, CA.

Labroo, A.A. and Lee, A.Y., 2006. Between two brands: A goal fluency account of brand evaluation. *Journal of Marketing Research*, *43*(3), pp.374-385.

Labroo, A.A. and Lee, A.Y., 2006. Between two brands: A goal fluency account of brand evaluation. *Journal of Marketing Research*, *43*(3), pp.374-385.

Labroo, A.A., Dhar, R. and Schwarz, N., 2008. Of frog wines and frowning watches: Semantic priming, perceptual fluency, and brand evaluation. *Journal of Consumer Research*, *34*(6), pp.819-831.

Lafferty, B.A. and Goldsmith, R.E. 1999. Corporate Credibility's Role in Consumers' Attitudes and Purchase Intentions When a High versus a Low Credibility Endorser Is Used in the Ad. *Journal of Business Research* 44(2), pp. 109–116.

Laghate, G. 2019. India sports sponsorship grew 12% to reach Rs 7,762 cr in 2018. Available at: https://economictimes.indiatimes.com/news/sports/india-sports-sponsorship-grew-12-to-reach-rs-7762-cr-in-2018/articleshow/68723847.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst [Accessed at: 14 April 2021]

Landwehr, J.R., Golla, B. and Reber, R., 2017. Processing fluency: An inevitable side effect of evaluative conditioning. *Journal of Experimental Social Psychology*, *70*, pp.124-128.

Landwehr, J.R., McGill, A.L. and Herrmann, A., 2011. It's got the look: The effect of friendly and aggressive "facial" expressions on product liking and sales. *Journal of marketing*, *75*(3), pp.132-146.

Lane, D., Beevers, M., Barnes, N., Bourne, J., John, A., Malins, S. and Beevers, D.G., 2002. Inter-arm differences in blood pressure: when are they clinically significant?. *Journal of hypertension*, *20*(6), pp.1089-1095.

Lang, A. & Chrzan, J., 2015. Media multitasking: Good, Bad, or Ugly?. Communication Yearbook, 39(1), pp. 99-128.

Lang, A. 2000. The Limited Capacity Model of Mediated Message Processing. *Journal of Communication* 50(1), pp. 46–70.

Lang, A. and Chrzan, J. 2015. Media Multitasking: Good, Bad, or Ugly? *Annals of the International Communication Association* 39(1), pp. 99–128..

Lanska, M., Olds, J.M. and Westerman, D.L., 2014. Fluency effects in recognition memory: Are perceptual fluency and conceptual fluency interchangeable?. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *40*(1), p.1.

Lardinoit, T, and Derbaix, C. 2001, Sponsorship and Recall of Sponsors, *Psychology and Marketing*, 18 (2), pp. 167–90

Laurent, G, and Kapferer, J.N. 1985, Measuring Consumer Involvement Profiles, *Journal of Marketing Research*, 22 (1), pp. 41–53

Lavie, N., 2005. Distracted and confused?: Selective attention under load. *Trends in cognitive sciences*, *9*(2), pp.75-82.

Lee, A. Y., & Aaker, J. L. 2004. 'Bringing the Frame Into Focus: The Influence of Regulatory Fit on Processing Fluency and Persuasion.', *Journal of Personality and Social Psychology*, 86/2: 205–18

Lee, A.Y. 2002. Effects of Implicit Memory on Memory-Based versus Stimulus-Based Brand Choice. *Journal of Marketing Research* 39(4), pp. 440–454.

Lee, A.Y. and Labroo, A.A., 2004. The effect of conceptual and perceptual fluency on brand evaluation. *Journal of Marketing Research*, *41*(2), pp.151-165.

Lee, A.Y. and Labroo, A.A., 2004. The effect of conceptual and perceptual fluency on brand evaluation. *Journal of Marketing Research*, *41*(2), pp.151-165.

Lee, M. and Faber, R.J. 2007. Effects of Product Placement in On-Line Games on Brand Memory: A Perspective of the Limited-Capacity Model of Attention. *Journal of Advertising* 36(4), pp. 75–90

Lee, Y.H. 2000. Manipulating Ad Message Involvement through Information Expectancy: Effects on Attitude Evaluation and Confidence. *Journal of Advertising* 29(2), pp. 29–43

Leonhardt, J.M., Catlin, J.R. and Pirouz, D.M., 2015. Is your product facing the ad's center? Facing direction affects processing fluency and ad evaluation. *Journal of Advertising*, *44*(4), pp.315-325.

Liaukonyte, J., Teixeira, T. and Wilbur, K.C., 2015. Television advertising and online shopping. *Marketing Science*, *34*(3), pp.311-330.

Lien, M.C., Ruthruff, E. and Johnston, J.C., 2006. Attentional limitations in doing two tasks at once: The search for exceptions. *Current Directions in Psychological Science*, *15*(2), pp.89-93.

Lord, K.R. and Burnkrant, R.E., 1993. Attention versus distraction: the interactive effect of program involvement and attentional devices on commercial processing. *Journal of Advertising*, *22*(1), pp.47-60.

Loschky, L.C., Ringer, R.V., Johnson, A.P., Larson, A.M., Neider, M. and Kramer, A.F., 2014. Blur detection is unaffected by cognitive load. *Visual cognition*, *22*(3-4), pp.522-547.

Lynn, N. 2016. The History and Evolution of Mobile Advertising. Available at: https://gimbal.com/history-evolution-mobile-advertising/ [Accessed: 11 September 2020].

Madjar, N. and Oldham, G.R. 2006. Task Rotation and Polychronicity: Effects on Individuals' Creativity. *Human Performance* 19(2), pp. 117–131.

Magnussen, S., 2009. Implicit visual working memory. *Scandinavian journal of psychology*, *50*(6), pp.535-542.

Malhotra, N.K., 2006. Questionnaire design and scale development. *The handbook of marketing research: Uses, misuses, and future advances*, pp.83-94.

Management Association, I.R. ed. 2017. *Advertising and Branding: Concepts, Methodologies, Tools, and Applications*. IGI Global. Available at: http://services.igi-global.com/resolvedoi/resolve.aspx?doi=10.4018/978-1-5225-1793-1 [Accessed: 11 September 2020].

Martí-Parreño, J. et al. 2013. Factors contributing brand attitude in advergames: Entertainment and irritation. *Journal of Brand Management* 20(5), pp. 374–388.

Mayer, R.E. and Moreno, R. 2003. Nine Ways to Reduce Cognitive Load in Multimedia Learning. *Educational Psychologist* 38(1), pp. 43–52.

MayfieldClinic. 2020. Anatomy of the Brain. Available at: https://mayfieldclinic.com/pe-anatbrain.htm#:~:text=The%20brain%20has%20three%20main,and%20fine%20control%20of%20movement. [Accessed: 20 April 2020]

Mayrovitz, H.N., 2019. Inter-arm systolic blood pressure dependence on hand dominance. *Clinical physiology and functional imaging*, *39*(1), pp.35-41.

McCambley, J. 2013. The first ever banner ad: why did it work so well? Available at: https://www.theguardian.com/media-network/media-network-blog/2013/dec/12/first-ever-banner-ad-advertising [Accessed: 11 September 2020].

McDonald, A. M. & Cranor, L. F. 2010. American's attitudes about internet behavioral advertising practices. In Proceedings of the 9th workshop on privacy in the electronic society (WPES) (October 2010), Chicago, Illinois, USA.

McGlone, M.S. and Tofighbakhsh, J., 2000. Birds of a feather flock conjointly (?): Rhyme as reason in aphorisms. *Psychological science*, *11*(5), pp.424-428.

McGuire, W., 1969. *The nature of attitudes and attitude change*. Vol. 3. Reading: Addison-Wesley Pub. Co.

McNicholas, J. Ranking the World's 10 Best Football Tournaments. *Bleacher Report.* Available at: https://bleacherreport.com/articles/1684009-power-ranking-worlds-10-best-football-tournaments [Accessed: 20 April 2021]

Mello, J., Garcia-Marques, T., Briñol, P., Cancela, A. and Petty, R.E., 2020. The influence of physical attractiveness on attitude confidence and resistance to change. *Journal of Experimental Social Psychology*, *90*, p.104-118.

Micu, C. C., Coulter, R. A., & Price, L. L. 2009. How Product Trial Alters The Effects of Model Attractiveness, *Journal of Advertising*, 38/2: 69–82.

Minamoto, T., Shipstead, Z., Osaka, N. and Engle, R.W., 2015. Low cognitive load strengthens distractor interference while high load attenuates when cognitive load and distractor possess similar visual characteristics. *Attention, Perception, & Psychophysics*, *77*(5), pp.1659-1673.

Mitchell, L. 2012. The future of marketing according to youth: what 16-24s want from brands. *The Guardian.* Available at: https://www.theguardian.com/media-network/media-network-blog/2012/oct/25/future-marketing-youth [Accessed: 20 April 2021]

Moore, R.S., Stammerjohan, C.A. and Coulter, R.A., 2005. Banner advertiser-web site context congruity and color effects on attention and attitudes. *Journal of advertising*, *34*(2), pp.71-84.

Moorman, M., Neijens, P. C., & Smit, E. G. 2002. 'The Effects of Magazine-Induced Psychological Responses and Thematic Congruence on Memory and Attitude toward the Ad in a Real-Life Setting', *Journal of Advertising*, 31/4: 27–40

Moorman, M., Willemsen, L.M., Neijens, P.C. and Smit, E.G., 2012. Program-involvement effects on commercial attention and recall of successive and embedded advertising. *Journal of Advertising*, *41*(2), pp.25-38.

Moreno, R. and Mayer, R.E., 1999. Cognitive principles of multimedia learning: The role of modality and contiguity. *Journal of educational psychology*, *91*(2), p.358.

Mostafa, A.M.S. and Bottomley, P.A., 2020. Self-sacrificial leadership and employee behaviours: an examination of the role of organizational social capital. *Journal of business ethics*, *161*(3), pp.641-652.

Murry, Jr., J. P., Lastovicka, J. L., & Singh, S. N. 1992. 'Feeling and Liking Responses to Television Programs: An Examination of Two Explanations for Media-Context Effects', *Journal of Consumer Research*, 18/4: 441

Naik, P.A. and Raman, K. 2003. Understanding the Impact of Synergy in Multimedia Communications. *Journal of Marketing Research* 40(4), pp. 375–388.

Naik, P.A. and Raman, K., 2003. Understanding the impact of synergy in multimedia communications. *Journal of marketing research*, *40*(4), pp.375-388.

Neijens, P. and Voorveld, H. 2015. Cross-Platform Advertising: Current Practices and Issues for the Future: Why the Gross Rating Point Metric Should Thrive in Today's Fragmented Media World. *Journal of Advertising Research* 55(4), pp. 362–367

Nelson, M. R., & Deshpande, S. 2013. 'The Prevalence of and Consumer Response to Foreign and Domestic Brand Placement in Bollywood Movies', *Journal of Advertising*, 42/1: 1–15.

Neuberg, S.L. and Newsom, J.T., 1993. Personal need for structure: Individual differences in the desire for simpler structure. *Journal of personality and social psychology*, *65*(1), p.113.

Nicholls, J. A. F., Roslow, S., & Laskey, H. A. 2011. 'Sports Event Sponsorship For Brand Promotion', *Journal of Applied Business Research (JABR)*, 10/4: 35.

Nicolaou, E. 2020. 20 Comforting TV Shows You Can Stream Right Now. Available at: https://www.oprahmag.com/entertainment/g31672861/comforting-tv-shows/ [Accessed at: 27 February 2021]

Nielsen. 2018. *The Nielsen Total Audience Report: Q2 2018*. Available at: https://www.nielsen.com/us/en/insights/report/2018/q2-2018-total-audience-report/ [Accessed: 20 April 2021]

Nielsen. 2018. World Football Report. Available at: https://www.nielsen.com/uk/en/insights/report/2018/world-football-report/ [Accessed at: 14 April 2021]

Norris, Claire E., and Andrew M. Colman 1993, 'Context Effects on Memory for Television Advertisements,' *Social Behavior and Personality*, 21 (4), 279–96.

O'Dea, S. 2020. Daily time spent online with smartphone in the UK 2018. Available at: https://www-statista-com.plymouth.idm.oclc.org/statistics/956864/daily-time-spent-online-with-smartphone-uk/ [Accessed: 22 June 2020].

O'Shaugnessy, J. and O'Shaughnessy, N. 2003. *Persuasion in Advertising*. Routledge. Available at: https://www.taylorfrancis.com/books/9781134354108 [Accessed: 11 September 2020].

Ofcom , 2017. Adults' Media Use and Attitudes. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0020/102755/adults-media-use-attitudes-2017.pdf [Accessed: 21 April 2021]

Ofcom , 2020. Adults' Media Use and Attitudes. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0031/196375/adults-media-use-and-attitudes-2020-report.pdf [Accessed: 21 April 2021]

OfCom. (2018). *Media Nations: UK 2018.* Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0014/116006/media-nations-2018-uk.pdf [Accessed: 20 April 2021]

Ofcom. 2015. Media Multitasking. London. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0020/47261/media_multitaskingl.pdf [Accessed: 11 September 2020].

Ofcom. 2019a. Adults' Media Use and Attitudes Report 2019. London. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0031/196375/adults-media-use-and-attitudes-2020-report.pdf [Accessed: 11 September 2020].

Ofcom. 2019b. Media Nations UK 2019. London. Available at: https://www.ofcom.org.uk/__data/assets/pdf_file/0019/160714/media-nations-2019-uk-report.pdf [Accessed: 11 September 2020].

Ohanian, R. (1990). 'Construction and Validation of a Scale to Measure Celebrity Endorsers' Perceived Expertise, Trustworthiness, and Attractiveness', *Journal of Advertising*, 19/3: 39–52.

Olds, J.M. and Westerman, D.L. 2012. Can fluency be interpreted as novelty? Retraining the interpretation of fluency in recognition memory. *Journal of Experimental Psychology: Learning, Memory, and Cognition* 38(3), pp. 653–664.

Oliver, R. L., & Bearden, W. O. 1985. Crossover Effects in the Theory of Reasoned Action: A Moderating Influence Attempt, *Journal of Consumer Research*, 12/3: 324.

Ophir, E., Nass, C. and Wagner, A.D., 2009. Cognitive control in media multitaskers. *Proceedings of the National Academy of Sciences*, *106*(37), pp.15583-15587..

Oppenheimer, D.M. 2008. The secret life of fluency. *Trends in Cognitive Sciences* 12(6), pp. 237–241.

Orme, S., Ralph, S.G., Birchall, A., Lawson-Matthew, P.E.T.E.R., McLean, K.A.T.H.E.R.I.N.E. and Channer, K.S., 1999. The normal range for inter-arm differences in blood pressure. *Age and ageing*, *28*(6), pp.537-542.

Oxford English Dictionary. 2020. Oxford Languages. Available at: https://www.lexico.com/definition/advertisement [Accessed: 22 June 2020]

Pallant, J., 2013. *Survival manual*. *A step by step guide to data analysis using SPSS*, *4*.New York. McGraw Hills.

Panão, M. R. & Radu, L., 2013. Advanced statistics to improve the physical interpretation of atomization processes. International Journal of Heat and Fluid Flow, Volume 40, pp. 151-164.

Park, S., Kim, M.S. and Chun, M.M., 2007. Concurrent working memory load can facilitate selective attention: evidence for specialized load. *Journal of Experimental Psychology: Human Perception and Performance*, *33*(5), p.1062.

Paul, R.J. and Weinbach, A.P., 2007. The uncertainty of outcome and scoring effects on Nielsen ratings for Monday Night Football. *Journal of Economics and Business*, *59*(3), pp.199-211.

Paul, R.J. and Weinbach, A.P., 2007. The uncertainty of outcome and scoring effects on Nielsen ratings for Monday Night Football. *Journal of Economics and Business*, *59*(3), pp.199-211.

Pavot, W., Diener, E., Colvin, C.R. & Sandvik, E. 1991. Further validation of the Satisfaction with Life scale: Evidence for the cross method convergence of wellbeing measures. *Journal of Personality Assessment, 57*, 149–61

Percy, L. and Rosenbaum-Elliott, R. 2016. Fifth Edition. *Strategic Advertising Management*. London. Oxford University Press.

Percy, L., Rosenbaum-Elliott, R. and Elliott, R.H., 2012. *Strategic Advertising Management*. London. Oxford University Press.

Peterson, R. A. 2001. On the Use of College Students in Social Science Research: Insights from a Second-Order Meta-analysis, *Journal of Consumer Research*, 28/3: 450–61

Petty, R. E., Cacioppo, J. T., & Schumann, D. 198). Central and Peripheral Routes to Advertising Effectiveness: The Moderating Role of Involvement, *Journal of Consumer Research*, 10/2: 135

Petty, R.E. 2012a. *Communication and persuasion: central and peripheral routes to attitude change.* London: Springer.

Petty, R.E. 2012b. *Communication and persuasion: central and peripheral routes to attitude change.* London: Springer.

Petty, R.E., Cacioppo, J.T. and Schumann, D., 1983. Central and peripheral routes to advertising effectiveness: The moderating role of involvement. *Journal of consumer research*, *10*(2), pp.135-146.

Petty, R.E., Wegener, D.T. and Fabrigar, L.R., 1997. Attitudes and attitude change. *Annual review of psychology*, *48*(1), pp.609-647.

Petty, R.E., Wells, G.L. and Brock, T.C., 1976. Distraction can enhance or reduce yielding to propaganda: Thought disruption versus effort justification. *Journal of Personality and social Psychology*, *34*(5), p.874.

Phelps, J., Nowak, G., & Ferrel, E. 2000. Privacy concerns and consumer willingness to provide personal information. *Journal of Public Policy & Marketing*, 19(1), 27–41.

Pichora-Fuller, M.K., Kramer, S.E., Eckert, M.A., Edwards, B., Hornsby, B.W., Humes, L.E., Lemke, U., Lunner, T., Matthen, M., Mackersie, C.L. and Naylor, G., 2016. Hearing impairment and cognitive energy: The framework for understanding effortful listening (FUEL). *Ear and hearing*, *37*, pp.5S-27S.

Pilotta, J.J. and Schultz, D., 2005. Simultaneous media experience and synesthesia. *Journal of Advertising Research*, *45*(1), pp.19-26.

Poljac, E., Kiesel, A., Koch, I. and Müller, H., 2018. New perspectives on human multitasking. *Psychological Research.* 82(1), 1-3.

Pool, M. M., van der Vaart, T. H., Beentjes, J. W. & Koolstra, C. M., 1999. Background Television as an inhibitor of Performance on Easy and Difficult Homework Assignment. San Francisco, 49th Annual Conference of the International Communication Association .

Pool, M.M. and Koolstra, C.M. 2003. The Impact of Background Radio and Television on High School Students' Homework Performance. *Journal of Communication* , p. 14.

Potts, C.A., Pastel, S. and Rosenbaum, D.A., 2018. How are cognitive and physical difficulty compared?. *Attention, Perception, & Psychophysics*, *80*(2), pp.500-511.

Puckett, J.M., Petty, R.E., Cacioppo, J.T. and Fischer, D.L., 1983. The relative impact of age and attractiveness stereotypes on persuasion. *Journal of Gerontology*, *38*(3), pp.340-343.

Reber, R. and Schwarz, N., 1999. Effects of perceptual fluency on judgments of truth. *Consciousness and cognition*, *8*(3), pp.338-342.

Reber, R., & Zupanek, N. 2002. *Effects of processing fluency on estimates of probability and frequency.* In P. Sedlmeier & T. Betsch (Eds.), *ETC. Frequency processing and cognition* (p. 175–188). Oxford University Press.

Reber, R., Schwarz, N. and Winkielman, P., 2004. Processing fluency and aesthetic pleasure: Is beauty in the perceiver's processing experience?. *Personality and social psychology review*, *8*(4), pp.364-382.

Reber, R., Winkielman, P., & Schwarz, N. 1998. Effects of perceptual fluency on affective judgments. Psychological Science,9(1), 45–48

Reckelhoff, J. 2001. Gender differences in the regulation of blood pressure. *Hypertension.* 2001 May; 37(5):1199-208.

Regan, D.T. and Cheng, J.B., 1973. Distraction and attitude change: A resolution. *Journal of Experimental Social Psychology*, *9*(2), pp.138-147.

Richter, M., Friedrich, A. and Gendolla, G.H., 2008. Task difficulty effects on cardiac activity. *Psychophysiology*, *45*(5), pp.869-875.

Robin. 2016. Global TV habits of young adults: Time shifting and reality TV dominate. *Netimperative.* 31 October. Available at: http://www.netimperative.com/2016/10/31/global-tv-habits-young-adults-time-shifting-reality-tv-dominate/ [Accessed: 19 June 2020].

Rodgers, S., 2003. The effects of Sponsor Relevance on Consumer Reactions to Internet Sponsorship. *Journal of Advertising,* 32(4), pp. 67-76.

Rogers, C. 2019. Love Island may be a ratings hit, but it's a brand risk. *Marketing Week* 5 June. Available at: https://www.marketingweek.com/love-island-sponsorship-risk/ [Accessed: 19 June 2020].

Rosenbaum, D.A., Meulenbroek, R.J., Vaughan, J. and Jansen, C., 2001. Posture-based motion planning: applications to grasping. *Psychological review*, *108*(4), p.709.

Rossiter-Base, S. 2018. Adults' Media Use and Attitudes Report 2019 –., p. 151.

Rubinstein, J.S., Meyer, D.E. and Evans, J.E., 2001. Executive control of cognitive processes in task switching. *Journal of experimental psychology: human perception and performance*, *27*(4), p.763.

Rukmini, S. 2019. In India, who speaks in English, and where? *Mint*. Available at: https://www.livemint.com/news/india/in-india-who-speaks-in-english-and-where-1557814101428.html [Accessed: 20 April 2021]

Russel, J.T. and R.W. Lane. 2002. Advertising a Framework. Upper Saddle River, N.J.: Prentice Hall.

Salvucci, D.D. and Taatgen, N.A., 2008. Threaded cognition: An integrated theory of concurrent multitasking. *Psychological review*, *115*(1), p.101.

Samuelson, C. D., 1991. Perceived Task Difficulty, Causal Attributions, and Preferences for Structural Change in Resource Dilemmas. Society for Personality and Social Psychology, 17(2), pp. 181-187.

Sanbonmatsu, D.M. and Kardes, F.R., 1988. The effects of physiological arousal on information processing and persuasion. *Journal of Consumer research*, *15*(3), pp.379-385.

Sanbonmatsu, D.M., Strayer, D.L., Medeiros-Ward, N. and Watson, J.M., 2013. Who multitasks and why? Multitasking ability, perceived multitasking ability, impulsivity, and sensation seeking. *PloS one*, *8*(1), p.e54402.

Sanders, A.F., 1983. Towards a model of stress and human performance. *Acta psychologica*, *53*(1), pp.61-97.

Sanders, A.F., 1998. *Elements of human performance: Reaction processes and attention in human skill*. Psychology Press.

Sayed, R. 2020. Only Fools And Horses tops list of TV shows that comfort Brits in times of crisis. Available at: https://www.mirror.co.uk/tv/tv-news/only-fools-horses-tops-list-21874023 [Accessed at: 27 February 2021]

Schmidt, S. and Eisend, M., 2015. Advertising repetition: A meta-analysis on effective frequency in advertising. *Journal of Advertising*, *44*(4), pp.415-428.

Schwarz, N., 2004. Metacognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology*, *14*(4), pp.332-348.

Schwarz, N., 2004. Metacognitive experiences in consumer judgment and decision making. *Journal of Consumer Psychology*, *14*(4), pp.332-348.

Scrimgeour, P. 2019. *Increase in urban viewing boosts Indian market.* Available at: https://www.sportcal.com/Insight/Features/126754?&f=i%3A2%2FMedia%7C [Accessed at: 14 April 2021]

Segijn, C. M., 2017. Everyday multiscreening: How the simultaneous usage of multiple screens affects information processing and advertising effectiveness. Amsterdam: Persuasive Communication.

Segijn, C.M. 2019. A new mobile data driven message strategy called synced advertising: Conceptualization, implications, and future directions. *Annals of the International Communication Association* 43(1), pp. 58–77. doi: 10.1080/23808985.2019.1576020.

Segijn, C.M. and Eisend, M. 2019. A Meta-Analysis into Multiscreening and Advertising Effectiveness: Direct Effects, Moderators, and Underlying Mechanisms. *Journal of Advertising* 48(3), pp. 313–332. doi: 10.1080/00913367.2019.1604009.

Segijn, C.M. and Eisend, M., 2019. A meta-analysis into multiscreening and advertising effectiveness: Direct effects, moderators, and underlying mechanisms. *Journal of Advertising*, *48*(3), pp.313-332.

Segijn, C.M. and Voorveld, H.A., 2020. A first step in unraveling synced advertising effectiveness. *International Journal of Advertising*, pp.1-20.

Segijn, C.M., 2019. A new mobile data driven message strategy called synced advertising: Conceptualization, implications, and future directions. *Annals of the International Communication Association*, *43*(1), pp.58-77.

Segijn, C.M., Voorveld, H.A. and Smit, E.G., 2016. The underlying mechanisms of multiscreening effects. *Journal of Advertising*, *45*(4), pp.391-402.

Segijn, C.M., Voorveld, H.A. and Smit, E.G., 2017b. How related multiscreening could positively affect advertising outcomes. *Journal of Advertising*, *46*(4), pp.455-472.

Segijn, C.M., Voorveld, H.A., Vandeberg, L. and Smit, E.G., 2017a. The battle of the screens: Unraveling attention allocation and memory effects when multiscreening. *Human Communication Research*, *43*(2), pp.295-314.

Segijn, C.M., Xiong, S. and Duff, B.R., 2019. Manipulating and measuring media multitasking: Implications of previous research and guidelines for future research. *Communication Methods and Measures*, *13*(2), pp.83-101.

Sentence, R. 2020. *13 stats that show how advertising is changing.* Available at: https://econsultancy.com/13-stats-that-show-how-advertising-is-changing/ [Accessed: 20 April 2021]

Shah, A.K. and Oppenheimer, D.M. 2007. Easy does it: The role of fluency in cue weighting. *Journal of Judgement and Decision Making.* 2(6).pp. 371-379.

Shah, M. 2020. Traditional Media vs. New Media: Which is Beneficial. Available at: https://www.techfunnel.com/martech/traditional-media-vs-new-media-beneficial [Accessed: 23 March 2021]

Shapiro, M.A. and Kim, H. 2012. Realism Judgments and Mental Resources: A Cue Processing Model of Media Narrative Realism. *Media Psychology* 15(1), pp. 93–119.

Shapiro, S. & Krishnan, H. S., 2001. Memory-Based Measures for Assessing Advertising Effects: A Comparison of Explicit and Implicit Memory Effects. *Journal of Advertising*, 30(3), pp. 1-13.

Shavitt, S., Swan, S., Lowrey, T.M. and Wänke, M., 1994. The interaction of endorser attractiveness and involvement in persuasion depends on the goal that guides message processing. *Journal of Consumer Psychology*, *3*(2), pp.137-162.

Shen, H., Jiang, Y. and Adaval, R., 2010. Contrast and assimilation effects of processing fluency. *Journal of Consumer Research*, *36*(5), pp.876-889.

Shin, M., Linke, A. and Kemps, E., 2020. Moderate amounts of media multitasking are associated with optimal task performance and minimal mind wandering. *Computers in Human Behavior*, *111*, p.106422.

Simmons, J.P. and Nelson, L.D., 2006. Intuitive confidence: choosing between intuitive and nonintuitive alternatives. *Journal of experimental psychology: General*, *135*(3), p.409.

Singh, J. P. et al., 1998. Reduced Heart Rate Variability and New-Onset Hypertension. *Hypertension,* 32(2), pp. 293-297.

Smit, E.G., Van Noort, G. and Voorveld, H.A., 2014. Understanding online behavioural advertising: User knowledge, privacy concerns and online coping behaviour in Europe. *Computers in Human Behavior*, *32*, pp.15-22.

Smith, M. 2019. *Profiles paints a picture of the audience for ITV's hit show.* YouGov. Available at: https://yougov.co.uk/topics/entertainment/articles-reports/2019/07/29/what-kind-person-watches-love-island [Accessed: 20 April 2021]

Solanki, J. D., Desai, F. H. & Desai, K. H., 2020. Heart rate variability is reduced in normal pregnancy irrespective of trimester: A cross-sectional study from Gujarat, India. *Journal of Family Medicine and Primary Care,* Volume 9, pp. 626-631

Southwell, B. G., 2005. Between Messages and People: A Multilevel Model of Memory for Television Content,". Communication Research, 32(1), pp. 112-140.

Spencer, S. J., Zanna, M. P., & Fong, G. T. 2005. Establishing a Casual Chain: Why Experiments are Often More Effective than Mediational Analyses in Examining Psychological Processes. *Journal of Personality and Social Psychology*, *89*(6), 845–851

SportsStar. 2020. *Sports sponsorship surges to Rs 9,000 crore in India.* Available at: https://sportstar.thehindu.com/other-sports/sports-sponsorship-world-cup-2019-kohli-dhoni-mary-kom-hima-das/article31069495.ece [Accessed at: 14 April 2021]

Srivastava, J., 2013. Media multitasking performance: Role of message relevance and formatting cues in online environments. *Computers in Human Behavior*, *29*(3), pp.888-895.

Stangor, C. and McMillan, D., 1992. Memory for expectancy-congruent and expectancy-incongruent information: A review of the social and social developmental literatures. *Psychological Bulletin*, *111*(1), p.42.

Stangor, C., & McMillan, D. 1992. Memory for expectancy-congruent and expectancy-incongruent information: A review of the social and social developmental literatures. *Psychological Bulletin, 111*(1), 42–61

Statistical Research Department. 2021. *Digital advertising spending worldwide from 2018 to 2024.* Available at: https://www.statista.com/statistics/237974/online-advertising-spending-worldwide/ [Accessed: 20 April 2021]

Steenkamp, J.E., M., Batra, R. and Alden, D.L., 2003, 'How Perceived Brand Globalness Creates Brand Value, *Journal of International Business Studies*, 34 (1), 53-65.

Strobach, T., Wendt, M. and Janczyk, M., 2018. Multitasking: Executive functioning in dual-task and task switching situations. *Frontiers in psychology*, *9*, p.108.

Swan, G. 2020. What Is OTT Advertising: A Breakdown of Over-the-Top Ads. Available at: https://tinuiti.com/blog/ott-over-the-top-ads/ott-advertising-guide/ [Accessed at: 27 February 2021]

Sweney, M. 2019. Love Island to be screened twice a year as ITV adds winter edition. *The Guardian* 24 July. Available at: https://www.theguardian.com/business/2019/jul/24/love-island-to-be-screened-twice-a-year-as-itv-adds-winter-edition [Accessed: 19 June 2020].

Tavassoli, N.T., 1998. Language in multimedia: Interaction of spoken and written information. *Journal of Consumer Research*, *25*(1), pp.26-37.

Taylor, S.E., 1981. Schematic bases of social information processing. *Social cognition*, pp.89-134.

Teddlie, C. and Tashakkori, A., 2009. *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. London. Sage.

Thomas, A. B. 2004. *Research Skills for Management Studies*. London: Routledge.

Till, B.D. and Busler, M., 2000. The match-up hypothesis: Physical attractiveness, expertise, and the role of fit on brand attitude, purchase intent and brand beliefs. *Journal of advertising*, *29*(3), pp.1-13.

Titchner, E. B. 1908. *Lectures on the elementary psychology of feeling and attention*. New York: MacMillan

Torelli, C.J. and Ahluwalia, R., 2012. Extending culturally symbolic brands: A blessing or a curse?. *Journal of Consumer Research*, *38*(5), pp.933-947.

Tormala, Z.L. and Rucker, D.D., 2007. Attitude certainty: A review of past findings and emerging perspectives. *Social and Personality Psychology Compass*, *1*(1), pp.469-492.

TotalSportek. 2020. 25 World's Most Popular Sports (Ranked by 13 factors). Available at: https://www.totalsportek.com/popular-sports/ [Accessed: 20 April 2021]

Toubiana, V., Narayanan, A., Boneh, D., Nissenbaum, H. and Barocas, S., 2010, March. Adnostic: Privacy preserving targeted advertising. In *Proceedings Network and Distributed System Symposium*.

TRUSTe. 2012. UK consumer data privacy study. TRUSTe Research in partnership with Harris Interactive. Available at: https://trustarc.com/british-consumer-dataprivacy-study/ [Accessed: 22 June 2020].

Tsiros, M. and Heilman, C. M., 2005, "The effect of expiration dates and perceived risk on purchasing behavior in grocery store perishable categories", *Journal of Marketing* **69**(2), 114–129.

Tucker Smith, C. and De Houwer, J., 2014. The Impact of Persuasive Messages on IAT Performance is Moderated by Source Attractiveness and Likeability. *Social Psychology* 45(6), pp. 437–448.

Tungate, M. 2007. *Adland: A Global History of Advertising*. London. Kogan Page Publishers.

Turner, J.C., Reynolds, K.J., Van Lange, P.A.M., Kruglanski, A.W. and Higgins, E.T., 2012. Handbook of theories of social psychology. London. Sage Publications Ltd.

Uchino, B.N., Berg, C.A., Smith, T.W., Pearce, G. and Skinner, M., 2006. Age-related differences in ambulatory blood pressure during daily stress: Evidence for greater blood pressure reactivity with age. *Psychology and Aging*, *21*(2), p.231.

Unnava, H.R. and Burnkrant, R.E. 1991. Effects of Repeating Varied Ad Executions or Brand Name Memory. *Journal of Marketing Research* 28(4), p. 406.

Unnava, H.R. and Burnkrant, R.E., 1991. An imagery-processing view of the role of pictures in print advertisements. *Journal of Marketing Research*, *28*(2), pp.226-231.

Vakratsas, D. and Ambler, T., 1999. How advertising works: what do we really know?. *Journal of marketing*, *63*(1), pp.26-43.

Van Cauwenberge, A., Schaap, G. and Van Roy, R., 2014. "TV no longer commands our full attention": Effects of second-screen viewing and task relevance on cognitive load and learning from news. *Computers in Human Behavior*, *38*, pp.100-109.

Van Lange, P.A.M. Kruglanski, A.W. Higgins, E.R. 2012. *Handbook of Theories of Social Psychology: Volume 1*. London. United Kingdom: SAGE Publications Ltd.

Vandeberg, L., Murre, J.M., Voorveld, H.A. and Smit, E.G., 2015. Dissociating explicit and implicit effects of cross-media advertising. *International Journal of Advertising*, *34*(5), pp.744-764.

VandenBos, G.R. 2015. APA Dictionary of Psychology. Second edition. Washington DC. American Psychology Association.

Veltman, J.A. and Gaillard, A.W.K., 1998. Physiological workload reactions to increasing levels of task difficulty. *Ergonomics*, *41*(5), pp.656-669.

Vernon, M.D., 1955. The functions of schemata in perceiving. *Psychological Review*, *62*(3), p.180.

Voorveld, H., 2011. Media multitasking and the effectiveness of combining online and radio advertising. Computers in Human Behaviour, 27(6), pp. 220-2206.

Voorveld, H.A. and Valkenburg, S.M., 2015. The fit factor: The role of fit between ads in understanding cross-media synergy. *Journal of Advertising*, *44*(3), pp.185-195.

Voorveld, H.A. and Viswanathan, V., 2015. An observational study on how situational factors influence media multitasking with TV: The role of genres, dayparts, and social viewing. *Media Psychology*, *18*(4), pp.499-526.

Voorveld, H.A., Neijens, P.C. and Smit, E.G., 2011. Opening the black box: Understanding cross-media effects. *Journal of Marketing Communications*, *17*(02), pp.69-85.

Voorveld, H.A.M. 2011. Media multitasking and the effectiveness of combining online and radio advertising. *Computers in Human Behavior* 27(6), pp. 2200–2206.

Wakefield, K.L., Becker-Olsen, K. and Cornwell, T. B., 2007, I Spy a Sponsor: The Effects of Sponsorship Level, Prominence, Relatedness, and Cueing on Recall Accuracy, *Journal of Advertising,* 36 (4), pp. 61–74.

Wang, Z. and Duff, B.R., 2016. All loads are not equal: Distinct influences of perceptual load and cognitive load on peripheral ad processing. *Media Psychology*, *19*(4), pp.589-613.

Wang, Z., David, P., Srivastava, J., Powers, S., Brady, C., D'Angelo, J. and Moreland, J., 2012. Behavioral performance and visual attention in communication multitasking: A comparison between instant messaging and online voice chat. *Computers in Human Behavior*, *28*(3), pp.968-975.

Wang, Z., Irwin, M., Cooper, C. and Srivastava, J., 2015. Multidimensions of media multitasking and adaptive media selection. *Human Communication Research*, *41*(1), pp.102-127.

Wänke, M. and Hansen, J. 2015. Relative Processing Fluency. *Current Directions in Psychological Science* 24(3), pp. 195–199.

Wann, D. L. & Branscombe, N. R., 1993. Sports fans: Measuring degree of identification with their team.. *International Journal of Sport Psychology,* 24(1), pp. 1-17.

WARC. 2020. *Global Ad Trends: The impact of COVID-19 on ad investment.* Available at: https://www.warc.com/content/article/warc-data/global-ad-trends-the-impact-of-covid-19-on-ad-investment/132679 [Accessed: 20 April 2021]

Wells, W., Moriarty, S.E. and Burnett, J., 2012. Advertising: Principles and Practice. 7th Edition. Englewood Cliffs, NJ: Prentice Hall.

Westerman, D.L., Lloyd, M.E. and Miller, J.K., 2002. The attribution of perceptual fluency in recognition memory: The role of expectation. *Journal of Memory and Language*, *47*(4), pp.607-617.

Wetherell, M. A. et al., 2006. The four-dimensional stress test: Psychological, sympathetic–adrenal–medullary, parasympathetic and hypothalamic–pituitary–adrenal responses following inhalation of 35% CO2. *Psychoneuroendocrinology,* Volume 31, pp. 736-747.

Wetherell, M.A. and Carter, K., 2014. The multitasking framework: The effects of increasing workload on acute psychobiological stress reactivity. *Stress and Health*, *30*(2), pp.103-109.

Whittlesea, B.W., 2002. False memory and the discrepancy-attribution hypothesis: The prototype-familiarity illusion. *Journal of Experimental Psychology: General*, *131*(1), p.96.

Whittlesea, B.W., Jacoby, L.L. and Girard, K., 1990. Illusions of immediate memory: Evidence of an attributional basis for feelings of familiarity and perceptual quality. *Journal of Memory and Language*, *29*(6), pp.716-732.

Whittlesea, B.W.A. 1993. Illusions of Familiarity. Journal of Experimental Psychology: *Learning, Memory, and Cognition*. 19(6), 1235-1253.

Wickens, C. D., 1976. The effects of divided attention on information processing in tracking. Journal of Experimental Psychology: Human Perception and Performance, 2, 1–13

Wickens, C. D., 1984. Engineering psychology and human performance. Columbus, OH: Merrill.

Wickens, C.D. 2008. Multiple Resources and Mental Workload. *Human Factors: The Journal of the Human Factors and Ergonomics Society* 50(3), pp. 449–455.

Wickens, C.D., 1991. Processing resources and attention. *Multiple-task performance*. London. Taylor and Francis.

Wickens, C.D., 2002. Multiple resources and performance prediction. *Theoretical issues in ergonomics science*, *3*(2), pp.159-177.

Wickens, C.D., 2002. Multiple resources and performance prediction. *Theoretical issues in ergonomics science*, *3*(2), pp.159-177.

Wickens, C.D., Boles, D., Tsang, P. and Carswell, M., 1984. *The limits of multiple resource theory in display formatting: Effects of task integration*. ILLINOIS UNIV AT URBANA-CHAMPAIGN.

Wickens, C.D., Hollands, J.G., Banbury, S. and Parasuraman, R., 2015. *Engineering psychology and human performance*. Psychology Press.

Wickens, C.D., Hollands, J.G., Banbury, S. and Parasuraman, R., 2016. *Engineering psychology and human performance*. London. Routledge.

Winkielman, P. and Cacioppo, J.T., 2001. Mind at ease puts a smile on the face: psychophysiological evidence that processing facilitation elicits positive affect. *Journal of personality and social psychology*, *81*(6), p.989.

Wood, P., 2020. *Coronavirus: Screen time soars as adults spend half their day on devices.* Available at: https://www.cityam.com/coronavirus-screen-time-soars-as-adults-spend-half-their-day-on-devices/ [Accessed: 20 April 2021]

Wood, W., Rhodes, N. and Biek, M., 1995. Working knowledge and attitude strength: An information-processing analysis. *Attitude strength: Antecedents and consequences*, *4*, pp.189-202.

World Bank. 2020. *United Nations Population Division. World Urbanization Prospects: 2018 Revision.* Washington DC

Yang, M. and Roskos-Ewoldsen, D.R., 2007. The effectiveness of brand placements in the movies: Levels of placements, explicit and implicit memory, and brand-choice behavior. *Journal of communication*, *57*(3), pp.469-489.

Yoon, S., Choi, Y.K. and Song, S., 2011. When intrusive can be likable. *Journal of Advertising*, *40*(2), pp.63-76.

Youn, S., 2009. Determinants of online privacy concern and its influence on privacy protection behaviors among young adolescents. *Journal of Consumer Affairs*, 43(3), 389-418.

Zajonc, R.B., 1965. Social facilitation. *Science*, *149*(3681), pp.269-274.

Zajonc, R.B., 1968. Attitudinal effects of mere exposure. *Journal of personality and social psychology*, *9*(2p2), p.1.

Zarouali, B., Ponnet, K., Walrave, M. and Poels, K., 2017. "Do you like cookies?" Adolescents' skeptical processing of retargeted Facebook-ads and the moderating role of privacy concern and a textual debriefing. *Computers in Human Behavior*, *69*, pp.157-165.

Zarouali, B., Ponnet, K., Walrave, M. and Poels, K., 2017. "Do you like cookies?" Adolescents' skeptical processing of retargeted Facebook-ads and the moderating role of privacy concern and a textual debriefing. *Computers in Human Behavior*, *69*, pp.157-165.

Zdravkovic, S., Magnusson, P., & Stanley, S. M. 2010. Dimensions of fit between a brand and a social cause and their influence on attitudes. *International Journal of Research in Marketing*, *27*(2), 151–160.

Zechmeister, E. and Nyberg, S. 1982. Human Memory: An introduction to research and theory. Monterey, CA. Brooks/Cole.

Zhang, W., Jeong, S.H. and Fishbein, M., 2010. Situational factors competing for attention: The interaction effect of multitasking and sexually explicit content on TV recognition. *Journal of Media Psychology: Theories, Methods, and Applications*, *22*(1), p.2.

Zhang, Y. and Buda, R., 1999. Moderating effects of need for cognition on responses to positively versus negatively framed advertising messages. *Journal of Advertising*, *28*(2), pp.1-15.

Zhao, X., Lynch Jr, J. G., & Chen, Q., 2010. 'Reconsidering Baron and Kenny: Myths and truths about mediation analysis', *Journal of consumer research*, 37/2: 197–206. The University of Chicago Press.

Zhou, L., Yang, Z., & Hui, M. K., 2010. 'Non-local or local brands? A multi-level investigation into confidence in brand origin identification and its strategic implications', *Journal of the Academy of Marketing Science*, 38/2: 202–18

ZIGT. 2015. SPOT Expert sessie: Synced Advertising. Available at: https://zigt.nl/spot-expert-sessie-syncedadvertising/. [Accessed on: 12 August 2020].