

Malcom Lees

A review of product integration in digital games and why neuromarketing may be of value in future research

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<p>The purpose of this study was to review product integration in digital games and recognize the benefits of the promotional channel. Another aim was to analyze previous research and identify gaps in general knowledge. Finally the concept of neuromarketing was examined as a potential modern research method for future research in the area of product integration in digital games.</p> <p>A qualitative method was applied. The study examined secondary data collected from sources that include: scholarly and peer reviewed publications, trade publications, popular publications such as magazines and newspapers, academic books and internet sites.</p> <p>It was found that the primary benefit of product integrations in comparison to traditional advertisements is that the consumer perceives them as entertainment instead of an advertisement, meaning that the counter-argumentation that is expected from a consumer when viewing an advertisement is bypassed. It was also discovered that digital games compared to traditional media offered the opportunity of dynamic advertisements, meaning that advertising campaigns can be personalized and/or customized mid-campaign. The analysis revealed that implicit memory might be more important than explicit memory to the processing of embedded advertisements in games, but that most of the research conducted has measured explicit memory. Neuromarketing was identified as a concept that could be applied in future research of product integration in games because it measures unconscious (implicit) processes with the use of neuro-imaging and psychophysiological techniques.</p> <p>It was concluded that digital games have massive potential as a channel for advertising because the games industry is growing exponentially. The principle conclusion was that in order for product integrations in digital games to be proved as effective promotional tools, more research is needed, especially into implicit memory. Neuromarketing was recommended because traditional research methods for measuring implicit memory are poor.</p>	
Keywords	Product integration, Digital Games, Neuromarketing, Advertising, In-game advertising, Advergaming, Marketing Research, Consumer Behaviour, Implicit memory



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1 Introduction

The expansion of the video and computer game industry has made advertisers aware of the potential of the medium as an advertising vehicle (Yang, Roskos-Ewoldson, Dinu & Arpan 2006: 143). Cory Treffiletti suggests in his blog that if researchers can make known the efficacy of game placements there is “..nowhere to go but up for in-game marketing!” (Treffiletti 2011). Unlike many other forms of media, gamers (people who play digital games) tend to enjoy brands integrated into games as it makes the experience more realistic. According to Nielsen Interactive Entertainment about 70 per cent of gamers react positively to brands or advertising incorporated in games as long as the integration remains contextually relevant and doesn't disrupt game-play. (Ryan & Jones 2012: 255.)

Product integration in digital games is at the centre of this study. However, before the topic is reviewed, we need to understand where the concepts originate from in a marketing context. After which the study will define the two options of product integration in games as well as reviewing the clear benefits of using the medium as an advertising channel. However, the review will also highlight the gaps in knowledge. The findings chapter will include opposing views discovered in the research as well as emphasize the need for further research in understanding the relationship between games and a consumers' memory. The end of the analysis phase of the study will introduce the concept of neuromarketing as a suggestion for further researchers to apply the modern marketing research methods in the field of product integration and digital games.

Neuromarketing is a scientific approach to understanding the subconscious reasoning and behaviour of consumers. The approach uses neuro-imaging and psychophysiological tools to measure brain and body signals. The review introduces this modern approach because traditional options to date have failed in researching the whole brain. Traditional research methods have focused on explicit or conscious memory, modern techniques offer the opportunity to research implicit or subconscious memory. Neuroscientists are increasingly casting doubt on the significance of the conscious mind. They are presenting us with evidence that most of what happens in our brains is happening below the arena of awareness (Blakemore 2010, Daily Telegraph).



2 Literature Review

In order to understand the implication of product integration in digital games, fundamental concepts from segments such as marketing, consumer behaviour, advertising and digital marketing will be reviewed. Later in this study the application of Neuromarketing to future research is suggested and thus accordingly, the literature review will also examine basic marketing research theory and include an introduction to Neuro-marketing.

2.1 Marketing

Marketing has evolved from the outdated idea of 'telling and selling' to the new notion of 'satisfying customer needs'. The concept of marketing is based upon understanding the needs, wants and demands of the consumer. So while the 'telling and selling' sense of marketing was based around selling a product after it was produced, Kotler explains (2005: 6) that in contrast, marketing begins even before a company has a product. "We define marketing as a social and managerial process by which individuals and groups obtain what they need and want through creating and exchanging products and value with others" (Kotler 2005: 6). This definition is explained by the core marketing concepts that can be seen in figure 1.

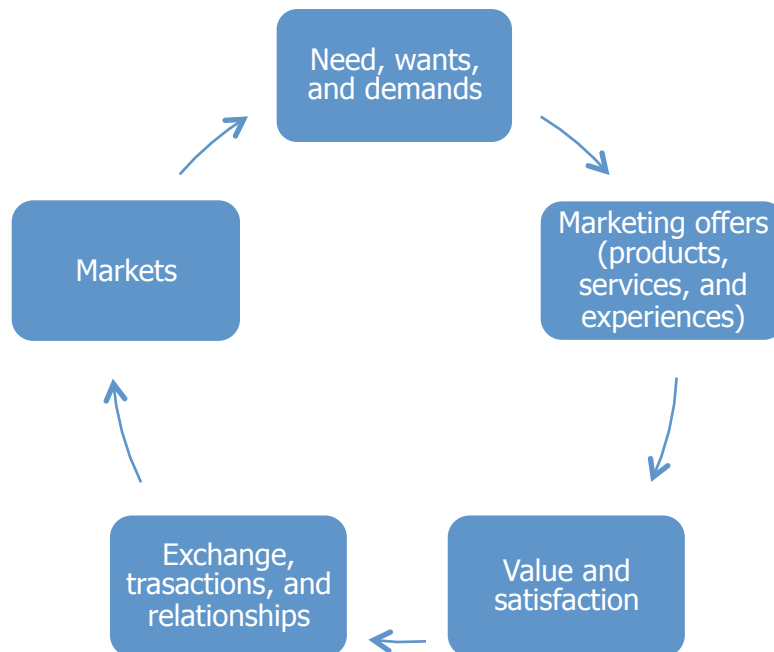


Figure 1. Core marketing concepts (Kotler 2005: 6)

Firstly, the most basic underlying concept of marketing is human needs; the three forms of human needs are needs, wants, and demands. As Kotler explains marketers did not invent these needs, they are simply a basic part of humanity. Needs include basic physical needs like, clothing, food and water, and shelter; social needs for belonging; and finally the individual need of self-expression and knowledge. Wants are an evolution of human needs shaped by culture and individual personality. A person's wants are shaped by the society he or she lives in and described by the object that will satisfy those needs. An example could be the preference of breakfast; an Istanbulite might prefer a traditional Mediterranean breakfast compared to a Mancunian who might prefer a full-English breakfast. Demand refers to the idea that people have basic needs and unlimited wants, but they also have limited resources. Based on an individual's wants and resources, he or she wants a product that ultimately has benefits that create the most satisfaction. (Kotler 2005: 8.) Understanding customer needs is essential in designing marketing strategies, thus the study of consumer behaviour is important and will be described further in section 2.2 (see pages 5-10).

After establishing the needs of a market, the next step in the marketing concepts is 'the market offering'. This can best be described as a combination of products, services, information or experience to fulfil the need or a want of a market. It is important that the marketer highlights the benefit and experience produced by a product. With this in mind a marketer can differentiate a product and brand by creating meaning and experiences for the consumer. (Kotler 2005: 9.)

Consumers make buying decisions based upon their opinion of how much value a product or service will deliver. The satisfaction of the customer is then based upon what extent the products perceived performance matches the actual performance. Based on the performance, the buyer will either be dissatisfied, satisfied or delighted. By satisfying the customer or exceeding expectations, a company can create repeat purchases. (Kotler 2005: 10.) Exchange will not be discussed, as it is not vital to this paper. Instead the review will move on to a discussion of markets.

Originally, the term market referred to a place where buyers and sellers met to exchange goods. This old definition still stands true, but in modern economic terms it describes buyers and sellers in a particular product class. Marketers however describe



the sellers of a particular product class as the 'industry' and the buyers as the 'market'. So essentially a 'market' in marketing terms is a grouping of actual and potential buyers of a product. (Kotler 2005: 11.) Figure 2 is introduced to create a clear picture for the reader. As stated in the opening paragraph of the literature review it is imperative to understand where the central concepts of this study stem from. The marketing process is a clear representation of where different concepts stand in the whole picture of marketing as well as the macro environment. The marketing process diagram will be referred to throughout the literature review chapters in order to display how each segment fits into the whole picture.

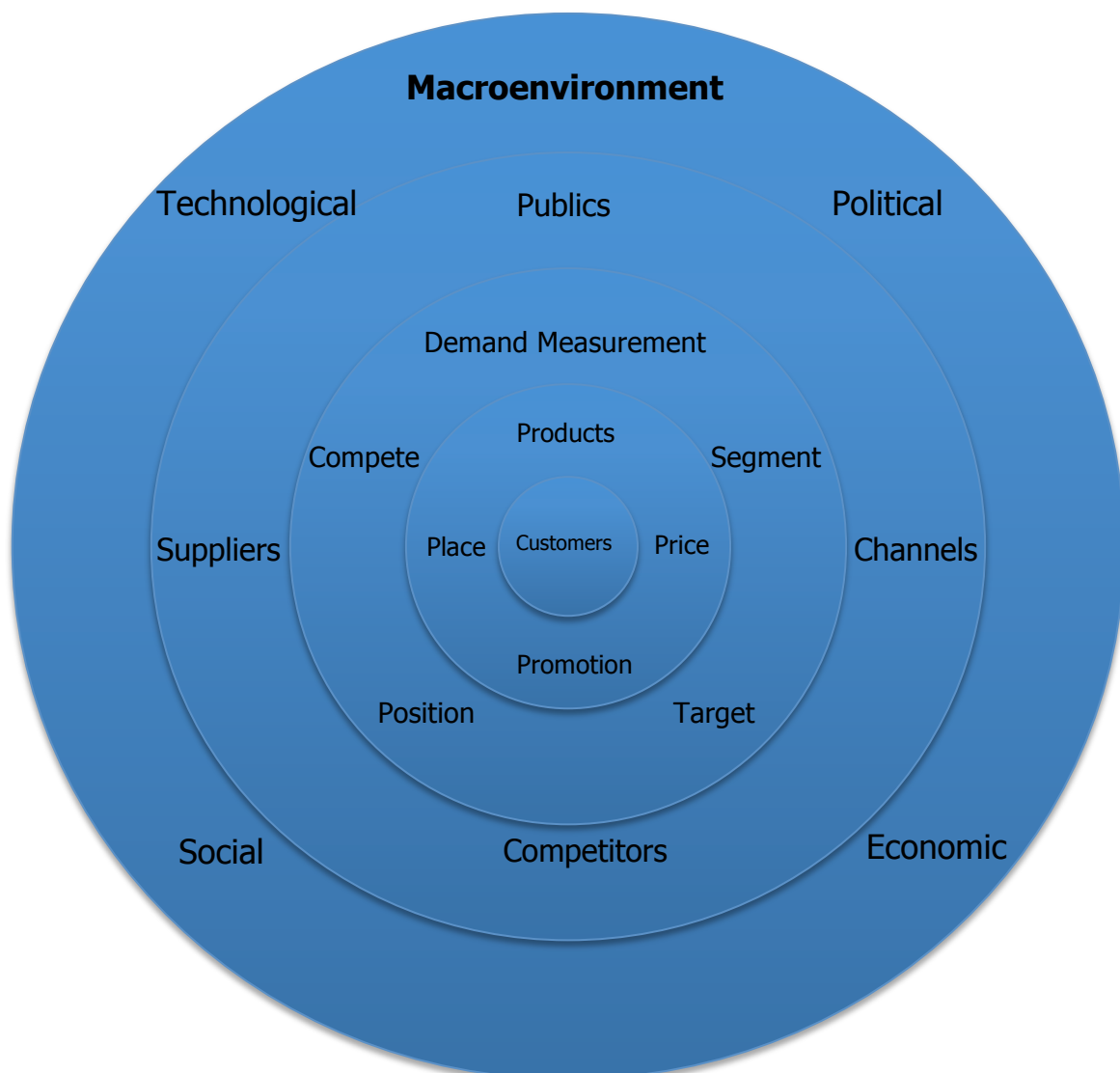


Figure 2. The marketing process

(Kotler 2005: 25)

As can be seen in Figure 2 the marketing mix P's are an essential tool that the marketer uses to make contact with potential customers. They include, product, price, place and promotion. (Kotler 2005: 24-25.) Advertising is a key concept of promotion and it will be reviewed right after consumer behaviour, which is logically the next section as it examines how the central circle in Figure 2, the customer, reacts to various external stimuli.

2.2 Consumer Behaviour

The richness of marketing originates from the two most complex concepts; the human brain and the society that we live in (Kotler 2005: 29). Consumer behaviour is the study of why people buy, it's important because of the premise that the marketer will be more able to create strategies that will influence the consumer to make a purchase if he or she know the reasons people buy specific products or brands (Blackwell, Miniard & Engel 2006: 4). According to consumer researchers, consumer behaviours derive from five orientations that are based in several social sciences: Anthropology, Economics, History and Geography, Psychology and Sociology. Psychology is most relevant to this study as it focuses on ideas of the personality and a study of the mind, e.g. attitude formation or decision-making. (Arnould, Price & Zinkhan 2004: 16-17.) Anthropology is also relevant in the study of consumer neuroscience (Braeutigam cited in Reimann, Schilke, Weber and Neuhaus, and Zaichkowsky 2011: 610). The concept of consumer behaviour in relation to this paper is the customer (see Figure 2: 5) and how he or she reacts to the product integration in digital games. The consumer decision making process will be assessed first.



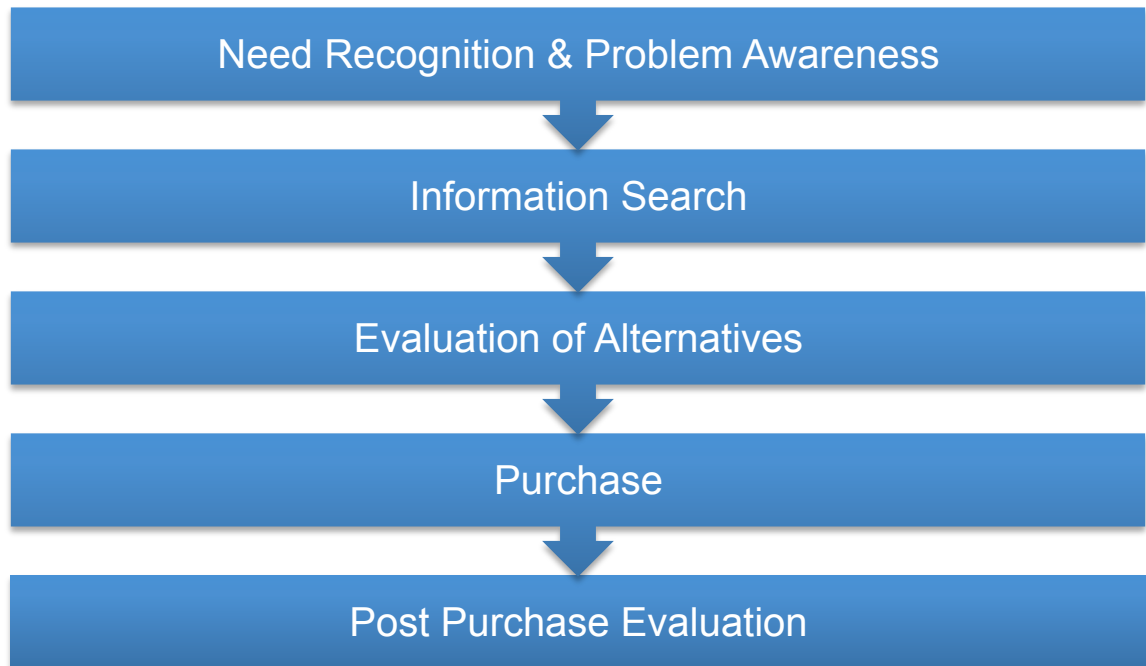


Figure 3. Consumer decision-making process (Engel, Blackwell & Miniard 2001: 94)

The initial stages of the process happen when a consumer realizes a problem in their present state and look for a solution in a new product that will solve the problem. According to Engel, Blackwell & Miniard the consumer then conducts internal and external information search for a new product. (2001: 106.) Internal research is a reference to scanning information from memory about previous research about a company and external research refers to the idea of collecting information from family, friends or the marketplace (Belch & Belch 2004: 41). In the context of this study internal information is more vital as the idea of product integration in games is to integrate a product or brand in the game experience so that the consumer will remember the company when he or she is making a consumption decision.

The next step in the process is the evaluation of alternatives. This can be described as the consumer evaluating options with his or her availability to different information resources such as the Internet and news. The next stages are the purchase stage and the evaluation of the purchase, which are less relevant to the scope of this study.

Marketers want to learn more about consumer behaviour and their central question is why and how consumers react to various marketing stimuli. The foundation of under-

standing is the stimulus-response model of buyer behaviour that can be seen below in figure 4.

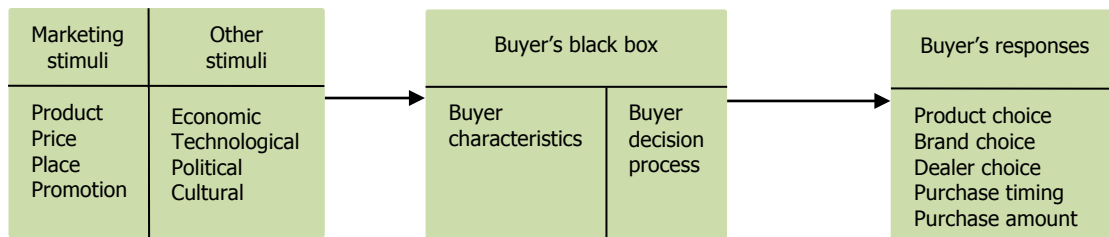


Figure 4. Model of buying behaviour (Kotler 2005: 255)

Figure 4 displays marketing stimulus entering the buyer's black box, which then produces certain responses (Kotler 2005: 255). In the case of this study, the consideration is of product integration (promotion) in digital games entering the consumer brain (buyer's black box), which based on his/her characteristics as well as decision process, results in buyer response. Marketers want to understand what happens in the black box, which has two parts. Firstly, how the buyer's characteristics influence his or her reaction to the stimuli. Secondly, how the decision process affects buying behaviour. (Kotler 2005: 256.) In order to understand how a consumer reacts to stimuli in a digital game context, theory of the limited capacity model of mediated message processing is important to understand as it examines how the consumers' brain is affected by playing digital games.

2.2.1 The limited capacity model of mediated message processing

The Limited Capacity Model of Mediated Message Processing (LC4MP) presented in this paper is by Lang (1992,1995) and was developed to investigate people and how they process television messages (Lang 2000: 27). However, the model is used throughout research conducted on processing of games and Lang states, "the model might be equally applied to other media" (2000: 63). The LC4MP assumes that humans have a limited capacity for cognitive processing of information. LC4MP has two major assumptions. Firstly, it assumes that people are information processors, meaning that a key duty that humans engage in is information processing. A person perceives stimuli, then turns that stimuli into mental representations, followed by mental work on said repre-

sentations, and finally reproduces the stimuli in the same or altered form. The second assumption is that a human's ability to process information is limited. To process stimuli there is a need for mental resources, however the theory assumes that a person has a limited pool of mental resources. (Lang 2000: 47.) Gordon claims that the reason telephone numbers are seven digits are because that is the maximum mental processing of a human brain (2001: 286). The most fundamental assumptions of information processing are three factors of cognitive processing, which are encoding, storage and retrieval (Lang 2000: 47).

2.2.2 Persuasion knowledge model

One of the primary tasks of a consumer is to deal with a marketer's sales and advertising tactics. With time a consumer will invariably develop knowledge about the tactics used in persuasion attempts. This knowledge helps understand when and why a marketer is trying to persuade them as well as helping the consumer adapt and achieve his or her own goals. The idea of the Persuasion Knowledge model is to understand how people's persuasion knowledge impacts the response to persuasion attempts. (Friestad & Wright 1994: 2.) A Persuasion Knowledge Model can be seen in Figure 5 (see page 9).



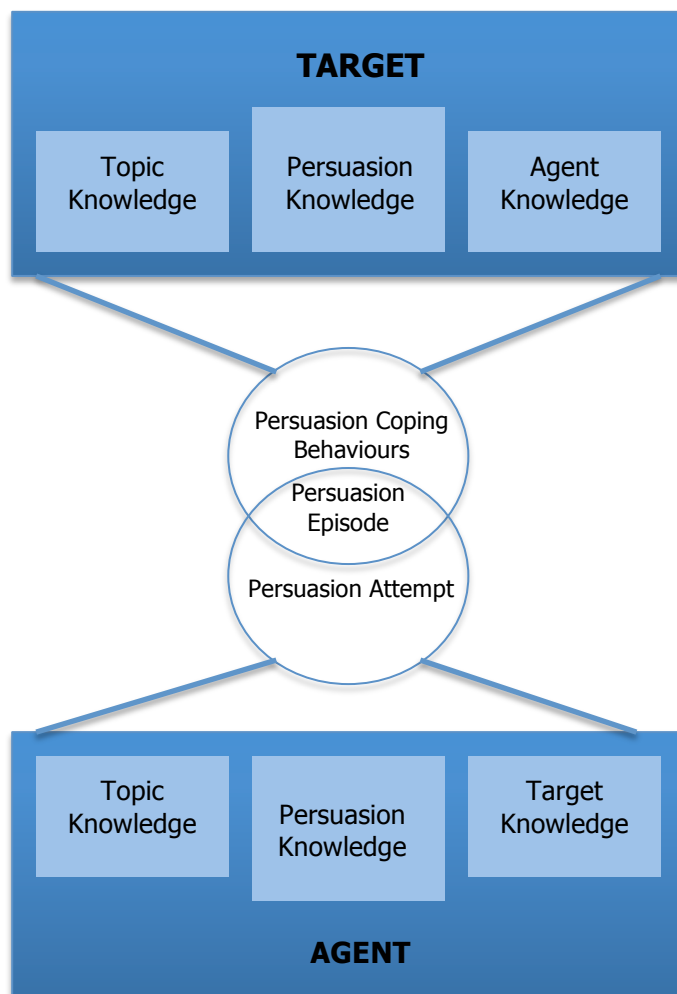


Figure 5. The Persuasion knowledge model (Friestad & Wright 1994: 2)

The Persuasion Knowledge Model (PKM) presented in Figure 5 is conceptualized by Friestad and Wright and is meant to have a broad application along persuasion context. The PKM model takes the perspective of both parties meaning the persuasion agent or marketer and the target or consumer. Persuasion attempt (bottom circle) is meant as a representation of the targets perception of the agents' strategic motif. To clarify the attempt is not limited to a message or advertisement, but also includes the targets opinion of why and how the agent has created and conveyed the message. The persuasion episode (middle circle) represents the actual advertisement or campaign (e.g. television commercial). This is directly observable by the target, as a concrete object. Finally the top circle is Persuasion Coping Behaviours and is meant as the response of the target to the persuasion attempt. This does not mean that a target re-

sists the persuasion attempt if he or she is aware of it, but rather has control over the outcomes. (1994: 2.)

When considering how the PKM applies to consumer coping behaviours, the three knowledge structures seen in figure 5 (persuasion knowledge, agent knowledge and topic knowledge) interact to create the outcome of the persuasion attempts. The first two consist of belief of the attributes and goals of the advertisement or persuasion agent. The latter is the targets opinion about the topic of the message. The explanation of the targets' perspective is more relevant to this paper as it stands to be reasoning for the benefit of product integration. (Friestad & Wright 1994: 3.) The next circle in Figure 2 (see page 4) is the 4 P's. Promotion is relevant to this study, meaning the next section will logically examine advertising.

2.3 Advertising

Advertising was around before marketing as it can be traced back to the very beginnings of recorded history (Kotler 2005: 762). Today advertising is an important segment of marketing; more specifically it is a part of promotion. Promotion is one of the four marketing mix P's which include Product, Price, Place, and Promotion. Kotler defines advertising "as any paid form of non-personal presentation and promotion of idea, goods or services through mass media" (2005: 762). Advertising is a part of the promotional mix or in other words 'marketing communications mix'. The mix also includes sales promotion, public relations, personal selling and direct marketing tools. The basic idea of the mix is to persuasively communicate customer value and build customer relationships. (Kotler 2008: 691.)

To promote a brand or product a company must select channels of communication. Generally speaking, the channel can be divided into personal and non-personal. (Kotler 2008: 707.) Personal communication channels refer to two or more people communicating directly with each other. Non-personal channels include media promotion that does not have personal contact or feedback. The message source is an important factor in choosing the channel; the credibility and attractiveness of the source can effect how the viewer perceives the product. (Kotler 2008: 709-710.) Once the channel is chosen and the promotion, in this case advertising is created, understanding how the



viewer perceives the message is important. Neuromarketing will be tied in later to describe the benefits of a scientific approach.

Advertising relative to the other promotional mix tools is the most important in relation to business-to-consumer markets. Advertising plays an important role in awareness and the knowledge stage of the buyer-readiness stages (Kotler 2008: 717). Management makes four important decisions when developing advertising: setting advertising objectives, setting the budget, developing the advertising strategy and evaluating the advertising campaign (Kotler 2008: 737). The objectives of the advertising can be classified as the primary purpose of the campaign, to inform, persuade or remind a viewer. Thus the three different types of advertising are as follows: Informative advertising, persuasive advertising and reminder advertising. (Kotler 2008: 738.) Reminder advertising is most relevant to this study as "the goal is to somehow change the way the customers think or feel about the brand" (Kotler 2008: 739). Reminder advertising helps to maintain relationships and keep customer's thinking about the product.

When evaluating advertising effectiveness the question of accountability is important. Return on Investment (ROI) in the marketing context refers to measuring the effectiveness of a marketing campaign reaching goals and objectives that were set for it. In short marketing is effective when it produces expected results and reaches agreed objectives in a set time. Marketing effectiveness or ROMI (Return on Marketing Investment) is one of the central concerns of any marketing department. (Flores 2013: 6-7.) Now that three central topics have been discussed, the idea of promotion in a digital context will be reviewed.

2.4 Digital marketing

The definition of digital marketing refers to the promotion of products and brands to consumers through the use of digital media and platforms. Digital Marketing accesses all forms of digital-media such as applications or otherwise known as apps. (Flores 2013: 3-4.)

Mobile apps are a highly significant development in digital communications. They highlight the change in the method of delivering interactive services and content via



phones. (Chaffey & Ellis-Chadwick 2012: 144.) Nielsen (2010) states that in the US alone there are more than 228 million mobile phone users over the age of 13 (Chaffey & Ellis-Chadwick 2012: 147).

Measuring the effectiveness of a digital campaign is important to a marketer. In terms of integration in games, branding measure is most relevant. Branding measure includes brand awareness, ad recall, brand favourability, and purchase intent. The relevance of the measurement scheme is to advertising or sponsorship. (Chaffey & Ellis-Chadwick 2012: 442.)

Table 1. Differences between traditional and digital media, (Chaffey & Ellis-Chadwick 2012: 437) rows 10-12 are similarities. Minimal changes have been made to the original version of the table.

Traditional Media	Digital Media
1. Push emphasis (e.g. TV and print ads and direct mail)	Pull emphasis, applicability to context (search engine marketing (SEM))
2. One-way communications	Dialogue and interactivity through user-generated content (UGC)
3. Targeting cost constrained by media placements	Micro-targeting and personalization through SEM and media placements or niche sites
4. Limited customer-to-customer interactions	Involvement, communities and social networks
5. Static campaigns – once campaigns have been booked with a media agency it is challenging to adjust them	Dynamic campaigns where it is possible to test alternative creative and targeting and then revise during campaign according to performance
6. Bust campaigns maximize ad impact over a short-term period	Continuous campaigns where a permanent presence is essential in online media (e.g. in SEM and aggregations)
7. Limited media-buying opportunities with high degree of wastage	Limitless media-buying opportunities with pay-per-performance options
8. Detailed response measurement often limited to qualitative research	Potentially measurable at micro-level through web analytics and ad tracking systems
9. Pre-testing	Can also test and refine during campaign
10. Most communications to reach audience via media owners	Media owners are still important but communications also possible via website and non-media owned blogs and social networks
11. Integrated communications vital	Integrated communications vital



There are multiple benefits of digital media in comparison to traditional media in relation to product integration. As can be seen in Table 1, a promotion can be targeted and personalized, meaning the delivering of individualized content to a consumer (Chaffey & Ellis-Chadwick 2012: 37). The use of dynamic campaigns (see table 1) is key to product integration. The benefits will be discussed further in section 4.7 (see page 35-36). Finally the ability to test the promotion throughout the campaign is another important benefit for this study. Now that the appropriate introductory theory has been reviewed, product integration can be introduced.

2.5 Product Integration

Product integration is a type of advertising and falls under promotion in reference to the 4 P's. Product Integration involves incorporating a service or a product into film, television show or another medium for the exchange of money or promotional consideration by a marketer. (McCartney & Lowrey 2012: ch. 2) Product Placement and Product Immersion are subcategories of Product Integration. It is important to remember that Product Integration only exists if the placement or immersion of a brand made in exchange for money or promotional consideration by a marketer. Brands can be placed in books to create authenticity of character or to help describe the nature of a character. (McCartney & Lowrey 2012: ch. 2.)

Product Placement means that a product is seen or mentioned in an entertainment medium. For example a character in a film is seen using or mentioning a product. An example of product placement is Red Stripe Beer being mentioned in the film 'The Firm' by Tom Cruise. (McCartney & Lowrey 2012: ch, 2.) In relevance to this study, a product placement refers to an in-game advertisement (IGA).

Product Immersion is the term for integrations in which a product or service is a focal point of the story. An example of product immersion is the film 'Harold and Kumar go to White Castle'. The restaurant chain is in the title of the film, as well as being a focal point of the story. The main character searches for the particular fast food restaurant as well as consuming and mentioning products. (McCartney & Lowrey 2012: ch, 2.) In relevance to this study, a product immersion refers to an advergence (AG). Nelson and Waiguny state: "Advergaming are games specifically designed to promote one company's brand or products" (2012: ch. 5).



Product integration is the fusion of advertising and entertainment. Product integrations generally can be considered riskier than conventional methods of advertising; however in many cases they are also a cheaper method. The biggest barrier for integrations has been the measure of effectiveness. (Williams, Petrosky, Hernandez & Page 2011: 2.) According to PQ Media (2005) the use of product integrations were expected to grow faster than that of traditional advertising and marketing (Williams et al. 2011: 4). According to Russell and Stern (2006) the fact that integrations are a way to reach consumers in a cost-effective way is why they will surpass traditional advertising. (Williams et al. 2011: 4) As mentioned in the previous section dynamic campaigns are a big benefit of digital media, this applies to integrations as well.

“Dynamic advertising is taking off and is probably the wave of the future. In dynamic advertising, a marketer can specify where ads are put, can set times when ads will run, can choose which audience type your ad goes to, and can get all the tracking available for Internet ads.” (Williams et al. 2011: 11)

The fusion of advertising and entertainment as mentioned before is a key strength of integrations as remarked by d’Astous and Chartier as they claim that the fact that placements are natural means that there is not counter argumentation leading to a more likely positive outcome (Balasubramanian et al. 2006: 128). The literature review will continue with explaining the relevance of marketing research as key to how a marketer tests advertising.

2.6 Marketing research

Marketing research is included in the literature review because later in the study Neuromarketing is recommended as a possible tool for future researchers in the field of product integration in digital games. The marketing research application of Neuromarketing is more relevant to the scope of this topic. In a more traditional stance, marketing research might have been included earlier in the literature review. However as it is more relevant in this study to understanding how Neuromarketing might assist future research it is included right before the next section, which will be Neuromarketing.

Comparable to advertising in how distinctive and important it is, marketing research is another specialized part of marketing. It is essential as the quality of marketing deci-



sions is in many cases based upon the quality of marketing research. (Kotler 2005: 31.)

“Marketing research is the function linking the consumer, customer and public to the marketer through information that is used to identify and define marketing opportunities and problems, to generate, refine and evaluate marketing actions, to monitor marketing performance, and to improve understanding of the marketing process” (Kotler 2005: 344).

Marketing research can be used for a wide variety of situations. It can be used in order to help marketers understand customer satisfaction and purchase behaviour. It can also be used to investigate market potential or market share. However, more important for this paper is marketing research being used to assess the effectiveness of the four P’s and in specific promotion. (Kotler 2008: 333.) In relation to this paper, the research of how a customer reacts to a promotion attempt is important. The use of Neuromarketing techniques to measure the stimulus of customers can be interpreted as experimental marketing research conducted with the use of modern technology due to a shift in the macro environment (see Figure 2: 4).

The following figure is imputed in this section as an example of how a marketer traditional would test a promotion effort. Figure 6 (see page 16) is classical representation of how a marketer improves the promotional persuasion attempt. The first stage, which is marked the screening phase, is a group of relevant individuals that fit the target market. The promotion is shown to the group and feedback is collected in terms of opinion. This information is then used to improve the persuasion attempt. The intervention stage is a reference to the targeting of real customers with the refined version of the persuasion attempt. As can be seen in figure 6 (see page 16), a customer’s cognitive and affective process is activated and attitudes and behavioural intentions are formed. The final stage or as it’s called in the figure is the outcome stage. The decision of purchasing or not purchasing occurs at this time, as do the consequences for the decision of both the individual and the larger society as a whole. This means that consumers might feel satisfaction with the purchase or regret and possible financial burden. The societal impact is a reference to a boost to the economy if the purchase is made and a drain if it is not. This is a generally accepted model of an appropriate method to pursue customers and increase sales. (Wilson, Gaines & Hill 2008: 394-395.



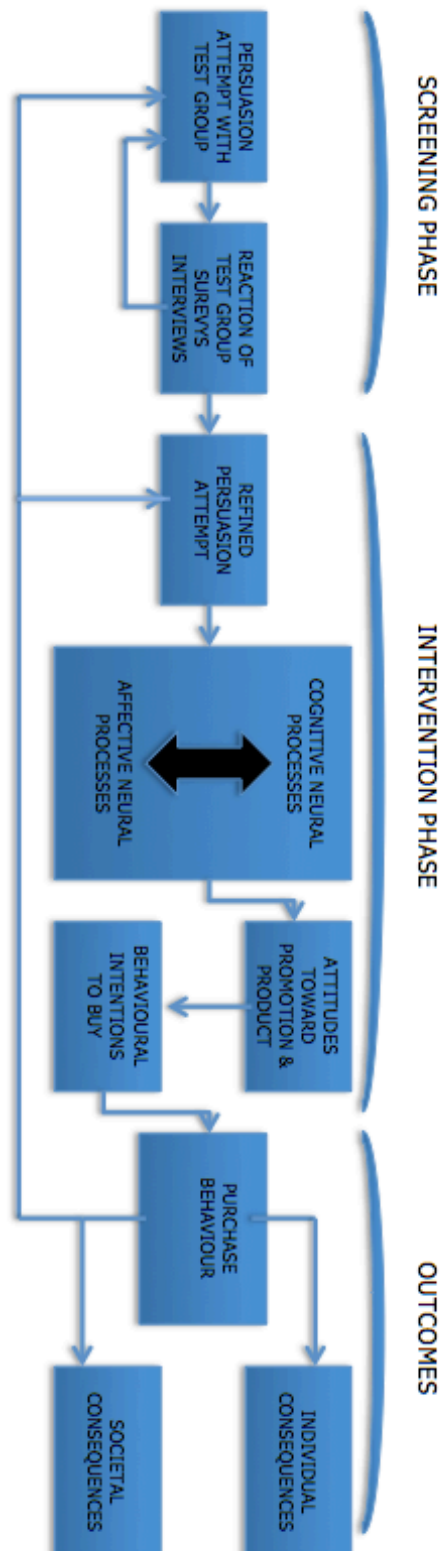


Figure 6. Traditional consumer persuasion model (Wilson, Gaines & Hill 2008: 395)

In traditional marketing research, the researcher asks the consumer to give their conscious opinion. It is important to clarify that Neuromarketing aims to bypass the opinion state and record the actual emotional stimulus from a scientific approach. It is important to note that the difference in research methods is how the researcher chooses to record the processing of the stimulus. The final section of the literature review will introduce Neuromarketing as a concept and later in the results will be discussed as a possible tool for future researchers.

2.7 Neuromarketing

The concept of Neuromarketing can be defined as the following: "Neuro-marketing draws on neuro-scientific technologies to understand the subconscious reasoning and behaviour of customers". Neuromarketing differs from traditional marketing research as it measures brain and body signals compared to traditional self-reporting tools such as surveys and interviews. (Probst, Frideres, Demetri & Vomhof 2014.) Before we examine modern Neuromarketing practice, the history of how Neuromarketing developed to its current level will be discussed.

The advertising industry realized the potential of psychology to understanding the consumers' subconscious in the early 1900's (Lewis 2013: 8). It was realized that advertising was as much persuasion as promotion (Lewis 2013: 10). "For the first time, the concept of persuasion, which is a prime role of a salesman, was applied to the creation of advertising" (O'Toole cited in Lewis 2013: 9). Psychoanalysts were the first psychologists to have a profound influence on advertising, the majority of whom were followers of Freud. Psychoanalysis places a lot of importance on the crucial part emotions played on a consumer's decision making. (Lewis 2013: 10.)

At the time Dr. Ernest Dichter was one of the leading psychologists following in the footsteps of Freud. He is known as the founder of motivational psychology. He set up the Institute for Research in Mass Motivation (Lewis 2013: 10) or the 'Dichter Institute' as called in The New York Times. Dichter went on to develop psychoanalytic theory and marketing that he sold to companies such as Exxon, DuPont and Colgate-Palmolive (Ames 1998, Archives). By the 1950's according to Lewis, an estimated billion dollars was being invested into psychological research (2013: 12).



Until the mid-1960s the talk of conscious and subconscious were regarded as unscientific. With time as the subconscious became more widely accepted, cognitive psychology would become accepted by the advertising industry. This new field was focused on skills such as memory, language, decision-making and reasoning. (Lewis 2013: 14-15.) The concept of neuromarketing was then developed. Professor Ale Smidts of Erasmus University, Rotterdam is regarded by many as inventing the term Neuromarketing in 2002. He did so explaining that the purpose of Neuromarketing was to better understand the consumers mind and his or her response to stimulus and in turn to improve marketing effectiveness. (Lewis 2013: 17.)

2.7.1 Measurement methods

A study commissioned by the European Union divides the methods of neuromarketing. It describes the first wave as 'direct studies' referring to analysing the brain with e.g. Electroencephalography (EEG) and functional Magnetic Resonance Imaging (fMRI) technology. The second wave is a focus on 'indirect studies' another words analysing changes in the physiological state. This includes the analysis of facial expressions, eye-movement, skin conductance, rate of inhalation and heart rate. (Probst, Frideres, Demetri & Vomhof 2014.)

To analyse the data collected my NM measurement techniques different software packages are available. Limited information is available, but according to Hammou, Galib & Melloul the most commonly used software for analysis of brain imaging data is statistical parametric mapping (2013: 22). Direct and indirect research methods or in other words NM measurement techniques will be reviewed later in Chapter 4 (see pages 39-41). Figure 7 is an example of an EEG device; developed by Neuro Focus in 2011, a leading neuromarketing company.



Figure 7. Mynd EEG scanner developed by NeuroFocus (Penenberg 2011, Fast Company)

Figure 8 highlights the difference of a traditional consumer persuasion model (figure 6: 16) compared to one with the application of neuro-imaging from the perspective of Wilson et al. (2008). One of the questions of marketers is why and how consumers react to various marketing stimuli. This section presents a consumer persuasion model that could be implemented into future research of product integration in digital games. Figure 8 (see page 20) or the collective Neuromarketing persuasion model is almost identical to Figure 6 (see page 16) or the traditional consumer persuasion model. It only differs in the screening phase; this model introduces neuroimaging into the consumer behaviour paradigm. Instead of asking for the conscious opinion of subjects, the consumers agree to neuroimaging measurements methods while observing the marketing stimuli. The insertion of Figure 8 here in the study is to highlight the difference in Neuromarketing research in regards to traditional marketing research methods.

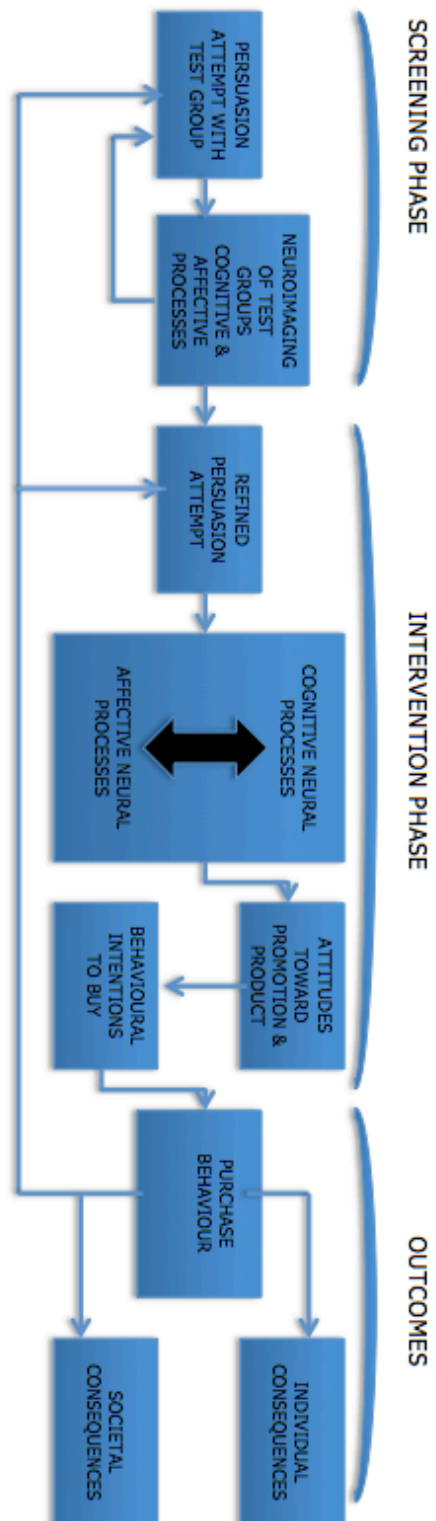


Figure 8. Collective Neuromarketing consumer persuasion model (Wilson, Gaines & Hill 2008: 397)

Reimann et al. highlights the advantages that neuro-imaging offers to this study. It allows for analysis of psychological process in the brain during information processing. The use of EEG, fMRI and MEG can measure brain functions as they react to promotional content (2011: 611). The neuro-imaging is used to record non-conscious affective processes, which are then used to design future persuasion attempts. If the neuromarketer is successful, the customer might react positively due to the triggering of affective parts of the brain. This clinical information about the mechanisms and function of the brain help explain what is occurring in the buyer's black box (Fugate 2007: 385) that might result in purchase decision. The behaviour will then loop back to the screening phase where the persuasion attempt will be continuously refined. This process allows for the improvement of the promotion with a combination of brain imaging and actual consumer behaviour. (Wilson, Gaines & Hill 2008: 397-398.) Understanding the scientific framework of the brain might not be essential as the study is marketing based, however the next section is included to provide some sort of basic understanding so that the reader might understand what part of the brain neuromarketers are studying.

2.7.2 Neuroanatomical framework of consumer decision making

According to Loewenstein, Rick & Cohen (2008) researchers mostly accept that brain functions rely on a scattered framework. Additionally, brain areas may contribute to more than a single function. (Reimann, Schilke, Weber and Neuhaus & Zaichkowsky 2011: 619.) The following numbers 1-11 are in reference to figures 9, 10 and 11 (see pages 22-23); 1: Putamen; 2: Caudate nucleus; 3: Nucleus accumbens; 4: Right anterior insula; 5: Anterior cingulate cortex (ACC); 6: Orbitofrontal cortex (OFC); 7: Ventromedial prefrontal cortex (VMPFC); 8: Medical prefrontal cortex (MPFC); 9: Ventral Tegmental area (VTA); 10: Amygdala; and 11: hippocampus.



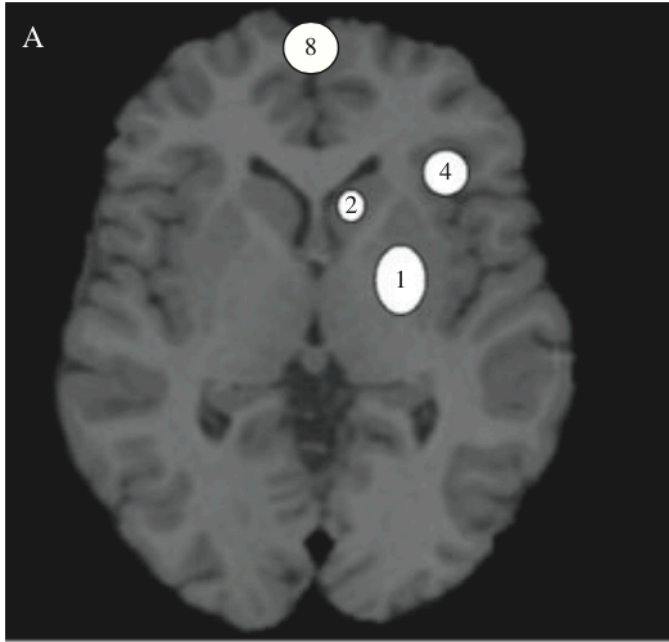


Figure 9. (A) Horizontal slice through the brain (Reimann, et al 2011: 621).

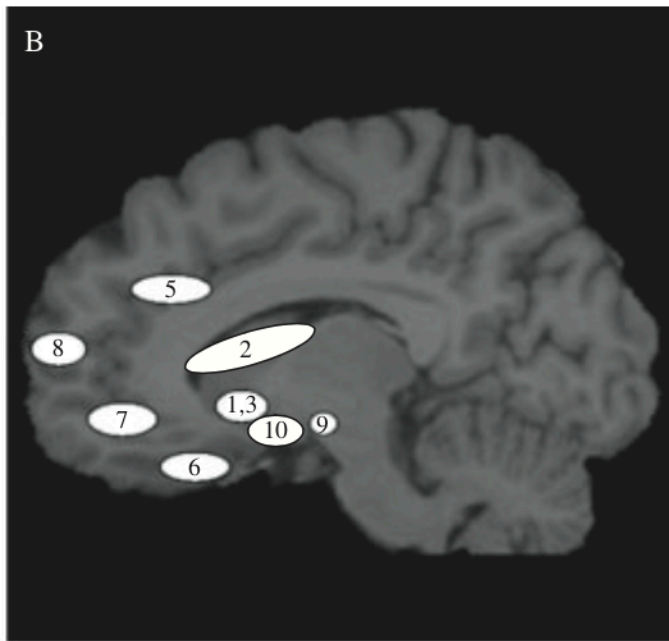


Figure 10. (B) Sideways slice through the brain (Reimann, et al 2011: 621).

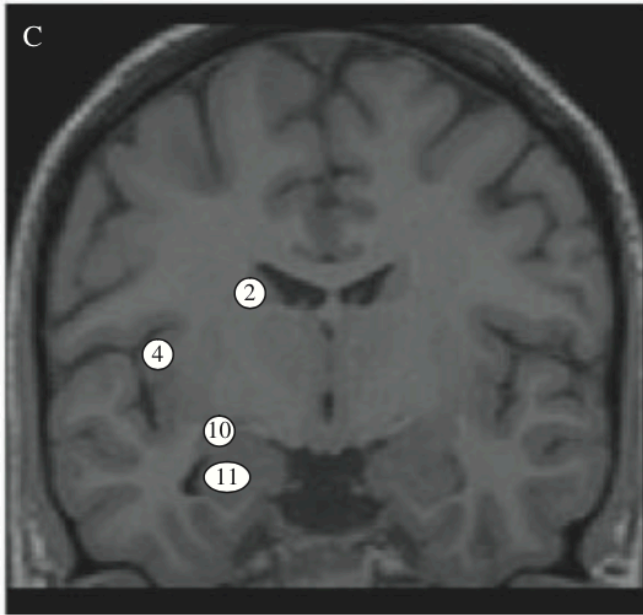


Figure 11. (C) Frontal slice through the brain (Reimann, *et al* 2011: 621).

As stated before, consumer neuroscience studies have found many different areas of the brain to be vital to consumer research:

Human brain architecture is organised in terms of functional modules capable of working both cooperatively and independently. These modules can carry out their functions in parallel and outside of conscious experience. The modules can effect internal and external behaviours and do this at regular intervals (Camerer, George & Drazen 2004: 560).

So the brain is like a large company – branch officers specialize in different functions but also communicate to one another and communicate more feverishly when an important decision is being made. Attention in neuroeconomics is therefore focused not just on specific regions but also on finding circuits or collaborative systems of specialized regions which create choice and judgement (Camerer, George & Drazen 2004: 561).

To begin, the striatum consists of different subareas that include the putamen, caudate nucleus and nucleus accumbens. Delgado (2007) states that these sub areas process goal-directed assessment of affective stimuli (Reimann, *et al*: 619). Affect refers to moods, feelings and attitudes. Knutson *et al.* (2007) claim that the striatum is responsible for coding product preference in purchase decisions. The Insula seems to code negative events such as losing money or social frustration (Knutson *et al.* 2007 cited in Reimann *et al.* 2011: 620).

Paulas & Frank (2003) state that the anterior cingulate cortex (ACC) has been associated with brand preference. Tremblay & Schultz (1999) claim the orbitofrontal cortex (OFC) and ventromedial prefrontal cortex (VMPFC) have been associated with being responsible for coding the perceived value of different conceivable results. O'Doherty et al. (2001) claim that the more medial areas of the OFC and VMPFC are linked with satisfying results and the lateral with the evaluation of punishing cues. It seems that the OFC incorporates affective and sensory data from different regions in the brain to derive the worth of a potential reward outcome, and how this outcome will meet the actual needs. (Reimann et al. 2011: 620.) This information of value delivered by the OFC will then be used by the medial prefrontal cortex (MPFC), which is linked to anticipated value (Amodio & Frith 2006: 275).

Fields (2007) states that ventral tegmental area (VTA) is mostly accountable for transmitting dopamine into most of the brain areas. Dopamine is a neurotransmitter that carries communication signals between brain cells. Dopamine regulates decision-making. VTA is also known to be involved in motivation. VTA could very well be essential for the processing of reward and novelty in advertising. (Reimann et al. 2011: 620).

The amygdala has been linked to the processing of negative emotions and also positive stimuli and rewards. (Murray cited in Reimann et al. 2011: 620). According to Wise (2006) the activation of the amygdala (in a negative or positive processing sense) is an important modulator of the memory system, thus clarifying the importance of the amygdala to the evaluation of marketing stimuli and its encoding in long-term memory (Reimann et al. 2011: 620).

Klucharev, Smidts & Fernandez (2008) and Wise (2006) state that the hippocampus plays a major role in memory and it might be linked to product memory (Reimann et al. 2011: 620).



3 Approach

To better understand the approach requires introductory theory of the purpose (exploratory, descriptive & causal), process (primary & secondary, quantitative & qualitative) as well as the outcome (applied & basic) and type of reasoning (deductive & inductive research). Next there will be an explanation of the research approach used in this study.

3.1 Purpose of research

Exploratory research involves literature search, as well as conducting interviews in focus groups. By exploring novel ideas, it can assist the researcher's need for better understanding and examine the feasibility of a further study as well as determining the best possible methods to be used in the study. It is clear that exploratory research is broad in focus and it most likely will not conclude with definite answers to a specific phenomenon. (Collis & Hussey 2009: 5.)

Descriptive research aims to provide specific description of observations. The idea behind the collection of data is to provide specific and accurate understanding of a population at a certain time. (Collis & Hussey 2009: 5.)

Causal research seeks explanations of the nature of relationships. For example an investigation into an issue that looks at the effect of one variable on another. (business dictionary.com). Hypothesis testing allows for understanding the relationship between different variables.

3.2 Process, outcome & reasoning

Primary data derives from sources that are self-generated and include; experimental designs, case studies, survey data, focus groups, etc. Secondary data derives from existing materials such as; company records, archives, union materials, census data, published research and government sources.



Quantitative and qualitative can be classified as data collection methods. There is a simple way to distinguish the two different types of methods, though it's important to remark at this point that it's not as black and white as that. Qualitative methods provide data through words and quantitative methods provide data through generating numerical data. These two methods are very often used in support of each other. (Collis & Hussey 2009: 7.)

Table 2. A comparison of quantitative and qualitative research

Quantitative Research	Qualitative Research
Objective is to test hypothesis	Objective is to discover the meaning of a phenomenon
Concepts are distinct variables	Concepts can be themes, motifs, generalizations
Standardized methods are created before data collection	Measures are specific and may be more specific to a researcher
Data is in the form of numbers	Data is in the form of words from documents, observations and transcripts
Theory is mostly causal and deductive	Theory can be in the form of causal or non-causal and is mostly inductive
Procedures are standardized and replication is assumed	Has specific procedures and replication research is difficult
Analysis uses statistics, tables and charts and is discussed in relation to the hypothesis	Analysis consists of taking themes and generalizations from the data that is collected and organizing is as to create a coherent picture. Generalizations can then be used to create a hypothesis.

Applied research refers to a project that is designed in order to apply finding to solve a specific or existing problem. Basic research or pure research refers to a project that aims to make a contribution to general knowledge and theoretical understanding, instead of solving a specific problem. (Collis & Hussey 2009: 7-8.)

Deductive research refers to a study where by a conceptual and theoretical framework are established, empirical observations take place leading to deduction of particular instances from common inferences. For this reason deductive reasoning is the moving from general to the particular. Inductive research moves in the opposite direction. It is research that describes a study where by the theory is created from the observation of empirical reality thus leading to inferences that are induced from particular instances.



Inductive reasoning moves from the particular to the general as it involves moving from personal observations to general laws. (Collis & Hussey 2009: 8.)

3.3 The research approach

This study falls into the scope of an exploratory research and the approach can be simply defined as conceptual analysis, or in other words a critical analysis of theories in this area. The defining of the methodological approach is based on a report by: Kuitinen, Kultima, Niemela and Paavilainen (2007). This is because the study reviews research of product integration in digital games, and considers the application of neuro-marketing in future research. This study thus has an aim of adding to previous knowledge and does not conclude with any definite answers.

The process of the study can be described as reviewing relevant literature. The literature is of secondary nature, meaning it has not been self-generated and is derived from existing materials. Qualitative research is used, there is no analysis of numerical data in the study, instead all information that is presented and analysed is in the form of words.

The nature of the research is basic, as mentioned a specific problem will not be solved, instead the study aims to contribute to general knowledge. This study uses inductive argumentation as its aim is to narrow the scope of product integration in digital games research.

4 Findings

This chapter will focus on a literature review of research conducted on product integration in games. After the two types of product integration, advergames and in-game advertisements are defined, a quick overview of the potential of the gaming market will be discussed, thereafter followed with analysis of research on how consumers process games and the advertisements embedded within them. After product integration in games has been covered, Neuromarketing will be introduced. The prior uses of the concept as well as an understanding of the technologies will be reviewed. The section will conclude with ways in which Neuromarketing tools can potentially assist researchers of the product integration and digital games fields.

4.1 Types of product integration in digital games

Advergames are classified as product immersions, meaning that a product or brand is the focal point of a story. As defined by Nelson and Waiguny "Advergames are games specifically designed to promote one company's brand or products; in this way, they most closely resemble a traditional advertisement". These games can be found on virtually all devices and platforms. Firstly, "reskinned games" are a form in which a brand's artwork is replaced with those of the existing game. The second form is a completely original game because it is designed from ground up for a brand. The third form is that in which a brand has an entire web game arena, for example a website full of interactive games. (2012: ch. 5.) In any case, Kretchmer states that all Advergames combine the two elements of brand and entertainment: and "offer advertisers a powerful and dynamic medium to engage consumers, build brand interactivity, drive traffic, and capture market information in the guise of entertainment" (2004: 48). Dahl, Eagle and Baez state that the aim of an advergame is to "offer entertainment and to engage web or electronic game users in order to make an emotional connection between the game and the brand featured within it" (2009: 47). Lee, Park and Wise suggest that when advergames are used, the type of game needs to be considered (2013: 1281).

In-game advertising (IGA) is classified as a product placement. Nelson and Waiguny define in-game advertising "or product placement in games, as the inclusion of a prod-



uct or brand within an existing digital game that also features other brands and products" (2012: ch. 5). The primary purpose of the game is to bring entertainment to the player. Thus, in-game advertising is second to the actual entertainment factor. In the beginning product placements in games were unpaid, with an intention of adding realism to a game. Vedrasho (2006) provides examples such as product placements of Ferrari, Renault and Lotus in Formula One game. Presently, placements can occur in the background (subtly) as billboards or a part of the scenery as well as prominently as they can be incorporated into game play, such as props, clothing, game tools, etc. (Neslon & Waiguny 2012: ch. 5.)

4.2 Market potential for product integration

Video games are one of the fastest growing areas of entertainment. According to the book 'Understanding digital marketing' it has been estimated that in-game advertising could be worth between 800 million dollars and 2 billion dollars. (Ryan & Jones 2012: 255) Similarly Loechner predicted in 2007 that by the year 2012 spending on adver-games would jump to more than 2 billion US dollars. (An & Stern 2011: 43) According to Juniper Research mobile game advertising spending will increase by more than 900 per cent during the next five years as of 2012. (Orland 2011, Gamasutra) According to the Entertainment Software Association (ESA) (2012) the average age of a player in the United States is 30 years old and has 12 years of gaming experience. Also according to the ESA 47% of gamers are women. (Terlutter & Capella 2013: 95). Gangadharbatla states that marketers and game manufacturers should realize the huge potential of the female market. (2008: 79) These figures solidify the potential in the gaming market, as well as providing insight into how demographically diverse the market is.

The mobile market constitutes one of the major marketing mediums as it combines so many channels such as TV, radio, Internet etc. A mobile phone is intimate because it is hand held. Mobile phones are almost always switched on which makes the consumer reachable at all time and is seen as one of the most measurable types of media. (Flores 2013: 13.) 8.4 billion dollars was spent on mobile advertising in 2012 and according to the Harvard Business Review that number is going to quadruple by 2016. Smartphone users spend more than 40% of app time with games and with tablet users that number is even higher. Red Bull has decided to create several gaming apps. The



type of games created includes Red Bull X-Fighters, Red Bull Kart Fighter and Red Bull Air Force. Apparently the apps have been downloaded around 2 million times, to the date of the article publication. The investment of creating gaming apps or another word advergames is paying off because every time an user plays the game he or she is engaging with the Red Bull brand. (Gupta 2013: 74-5.)

The best way for advertisers to communicate with end users will be apps. Sunil Gupta claims in an article in the Harvard Business Journal that "In surveys, four out of five people dislike them" (Gupta 2013: 72) referring to mobile advertisements such as banners that pop up when you open an app. The reason that apps will trump ads is that users view apps as functional and so they don't find them intrusive. Apps happen to be more cost-efficient and they also have the potential of creating completely new revenue streams. According to the article 82% of minutes spent are with apps compared to 18% with browsers. The two leading types of apps are (1) Games and Entertainment which account for 42 % (2) Social Networks account for 31%. (Gupta 2013: 72)

4.3 Psychological processing of digital games

This section explains how playing games is psychologically processed, thus highlighting why games can be an effective media channel for advertising. Grodal (2000) states that games arouse the player, defined by Mehrabien & Russell "as an affective state: a feeling state of activation that varies drowsiness to frantic excitement (Nelson & Waiguny 2012: ch. 5). The excitement is a part of the entertainment media, however as it will be noted later entertainment does not always create positivity.

Games can generate a wide array of emotions such as joy or pleasure. This is without doubt, as at one time or another everyone has played a game and felt some sort of enjoyment, whether the game is digital or not. However, a more complex concept is that games can also create meta-emotion. In other words, if the gamer is satisfied with the primary emotion that is expected from playing the game he/she might feel a secondary set of emotions known as meta-emotion. (Bartsch, Vorderer, Mangold & Viehoff 2008: 16-17.) Nelson & Waiguny draw the attention to fear; if a gamer is playing Doom (Horror/thriller game) the expected emotion is fear. This obviously is not a posi-



tive emotion, but when the emotion is experienced he or she also experiences a meta-emotion in the form of a pleasurable consumption experience. (2012: ch. 5.)

Gameplay is a highly complex media environment compared to other media such as television or film. It differs heavily because the user not only focuses on content, but also on the controls; thus requiring full-bandwidth meaning that multiple senses are at work and the player has full attention. Rich sensory games and cognitive immersion can result in a state of 'flow' experienced by the player; Csikszentmihalyi (1990) described it as an optimal level of consciousness, characterized by a level of concentration that leads to complete absorption in an activity (Riva, Waterworth & Waterworth: 412).

To attain the level of flow a game designer aims to create a game that is optimal for the person playing it. In other words designing a game in which the challenge of playing the game meets the skill level of the player (Chen 2007: 34). Skill level can refer to the expertise of a player based on how much time he or she has invested in playing games. Csikszentmihalyi states if the game is too challenging for the players' skill it can lead to emotions such as anger and anxiety; on the other end of the scope, a game that doesn't provide challenge to a player may very well lead to boredom (Nelson & Waiguny 2012: ch. 5). The importance of an optimal level of challenge to creating flow is vital, which essentially is the mark of a game that will be enjoyed by the player.

Telepresence is closely related to the discussion of flow. Coyle and Thorson define the subject in marketing terms as the sense of being there and feeling as if one is inside the mediated environment (2001: 66). Media creates telepresence, but the reason why the web environment creates increased telepresence is: (1) greater interactivity, (2) increased vividness and (3) three-dimensional visuals (Coyle & Thorson 2001: 75; Li, Daugherty & Biocca 2002: 54). A paper by Riva et al. states that telepresence can cause physiological events such as increased arousal levels (2004: 410). Finally, the value of telepresence for advertisers is simply that it can increase or enhance a consumer's: product knowledge, brand attitudes and purchase intentions (Li et al. 2002: 49).



4.4 Memory-based measures

To understand the effectiveness of advertising in the digital game entertainment media, three memory-based measures of brand are used: (1) recognition, (2) implicit recall (3) and explicit memory. The limited research that has been done on advertising effectiveness in games lack theoretical framework, the most used framework throughout the research conducted for this study is the limited capacity model for mediated message processing (LC4MP) (see page 7). The basic assumptions of LC4MP are that players' mental resources for the processing of a game are limited and allocated to primary and secondary tasks.

Research by Lee & Faber shows that a game user will allot most of his/her cognitive resources to the game play (2007: 86). This is important to remark because unlike other media such as television where the plot is fixed, in a game the plot is based on players' behaviour (Grodal cited in Thomson 2010: 441). Essentially this means that a player must understand and learn gameplay and thus requires full cognitive efforts. In other words meaning that gameplay according to the limited capacity model for mediated message processing is the primary task. This is important for advertisers as it potentially leaves little, if any cognitive resources for processing advertising. With this assumption in mind, the presumption that implicit memory is more relevant to advertisers in reference to using digital games as an advertising vehicle compared to explicit memory is very viable. Research conducted by Yang et al, suggest that respondents exposed to brands in games showed higher implicit memory than explicit, the word fragment test was used to test implicit memory (2006: 149).

Research has generally shown that recall for brands in in-game advertisements and in advergames have much lower explicit brand recall compared to brands embedded in television (Nelson & Waiguny 2012: ch. 5). It can be argued that few mental resources are left for the secondary task of explicit recalling of brands because a player is "too focused" and "in the game" due to the state of 'telepresence'. Most research has been centred on measuring explicit memory, but it seems that if research was to focus on implicit memory recall there could be very different results. Terlutter and Capella (2013: 107) mention the need of including more implicit memory measures in future research.



4.5 Factors that effect the persuasive power of the product integration

The design of a game and its gameplay, the level of entertainment produced for the player by the game and the way the brand message is included in a game are the factors that embody the persuasive power of the medium (Nelson & Waiguny 2012: ch. 5). McCarty writes, "a good product placement may be one that fits with the story in such a way as to make us forget that it is there to persuade us. This idea of fit of product placement is critical and relates to the notion of seamlessness" (2004: 50-51) or in other words congruity.

The first factor that influences brand memory and persuasiveness in a game is the congruity between a brand and the game. There are opposing views in research about the effect of congruent and non-congruent placements. Lambert claims that a congruent ad can attract a person's attention unconsciously, thus making the ad easier to retrieve (1980: 38; Bhatnager, Aksoy & Malkoc 2004: 107). Additionally in reference to advergames as well as in-game advertisements, at least one study has found a positive correlation with increased implicit and explicit brand recall when an ad is featured prominently as well as being congruent with the plot (Peters, Leshner, Bolls & Wise 2009: 3).

The non-congruent argument stems from the idea of novelty. Von Restorff wrote (1933) that unexpected or novel information might be more accepted than expected information. This theory is backed further by New (1991) suggesting that the route to visibility, provided by incongruent ads might increase prominence. (Nelson & Waiguny 2012: ch. 5.) It might be argued that congruent games fare better in advergames because the brand is already centrally prominent, while non-congruent brands might be better suited for in-game advertisements to create more prominence for the embedded brand. It is also important to note that incongruity can cause a player to feel annoyed because the brand is taking away from his/her experience (Bhatnagar et al. 2004: 107). Thus naturally the player might feel a negative emotion towards the brand. Vice versa if a brand is congruent, then the player may feel favourably towards it, because it doesn't take away from the experience, instead it enhances it (Maoz & Tybout 2002: 120; Sengupta, Goldstein & Boninger 1997: 355).



Placement strength can be defined as “the number of brand mentions, visual or verbal inclusions or both, appearance in the foreground, actual usage and integration with the contents.” (Bhatnagar et al. 2004: 108). The next factor that might influence brand memory or persuasiveness in a game is the prominence of a placement. According to Gupta & Gold a prominent placement is a product or brand or other identifier that is very visible and central to gameplay. On the other end of the spectrum a subtle placement is one, which is not shown prominently, instead the product, brand or other identifier is small or appears in the background meaning less exposure time for the placement. (1998: 49.) Research by Cauberghe and Pelsmacker confirm the results of Gupta & Gold in that prominence has positive impact on brand recall (2010: 12). Just like the analysis discussed in the section 4.3 about creating a game with optimal challenge for user, the same can be presumed true for the prominence of the placement. The optimal level of exposure might lead to increased persuasiveness of the embedded content as well as increased recall. If there is too much exposure, we can presume that the persuasion attempt will suffer due to the theory of wear-in and wear-out effects of communication. (Berlyne cited in Nelson & Waiguny 2012: ch, 5.)

4.6 Factors influenced by the gamer

Another group of factors that can influence the persuasiveness of embedded advertising are: (1) familiarity of prior use of the embedded brands, (2) the gaming experience of the player, (3) and the level of persuasion knowledge of a player (Nelson & Waiguny 2012: ch. 5). In reference to the first factor of familiarity, research has found differing opinions as with much of the research conducted in the field. It has been claimed that prior knowledge of a brand leads to an embedded brand being recognised (Brennan & Babin 2004: 198) as well as being recalled more often than an unfamiliar one (Nelson 2002: 88). On the other hand Machleit & Wilson found that persuasion affects are rather weak for familiar brands (1988: 33).

A study by Gross tried to take into account how gaming experience might effect how one might process embedded brands (2010: 1261). It becomes difficult to draw conclusions because the testing varies; e.g. whether to consider the expertise within a game or expertise of gaming experience generally. Additionally, Cowley, Charles, Black



& Hickey highlight another issue, it is clear that not everyone is entertained in the same way. They also go on to explain that experience in an advergame specifically will most likely not lead to positive attitudes toward the brand because it is boring. (2008: 7.) As discussed earlier the optimal challenge level for a gamer is essential for enjoyment, but this type of challenge level is clearly more difficult to achieve in simpler game mechanics such as in advergames. Greenfield, DeWinstanley, Kilpatrick & Kaye suggest that expert gamers have higher levels of skill thus having the attributes necessary to decode gameplay as well as perceive visual stimulus as they have better hand-eye coordination and control over the game (1994: 116). The limited capacity model of mediated message processing (see page 7-8) would thus suggest an expert gamer has more resources left for processing of an embedded ad, or the secondary task. Lee and Faber go on to explain that novice players in their experiment were unable to recognize peripheral or subtle placements due to the fact that most of their mental resources were being used for gameplay (2007: 86).

The final factor is a consumers' knowledge of a persuasion attempt. As discussed in 2.2.2 (see pages 8-10), the persuasion knowledge (PKM) model implies that a consumer will process a message from a non-persuasion situation differently than in a situation where the consumer feels that there is a definite attempt of persuasion (Wei, Fisher & Main 2008: 38). Thompson explains that advergames can be used as an example of non-persuasion setting as the focus of the consumer is on the entertainment (2010: 438). Traditional advertising such as a television advertisement, is a setting in which the consumer is aware of a persuasion attempt.

4.7 Benefits of advertising in digital games

This section highlights some of the key advantages of using games as the advertising media vehicle in comparison to other alternatives. Firstly, games have the advantage of their interactive nature (Hang & Auty 2010: 70). Interactivity is what differs games from other media as it offers the audience the control of processes and outcomes of the game (Owen, Hang, Lewis & Auty 2012: ch. 4). Secondly, in comparison to traditional media, games generally have a much longer shelf time (see table 1: 12). In other words the exposure of the medium is usually longer. Thirdly, games tend to have an increased amount of sensory immersion. Bailey, Wise & Bolls agree that immersion in



games could make the persuasive impact of games different than traditional advertisements (2009: 282). Fourthly, the interactive nature of games tends to create a bidirectional information flow between the users and the game, which consequentially can increase players' exposure to said advertisement. This exposure can possibly lead to the formation of positive attitudes with the placed brands. (Owen, Hang, Lewis & Auty: ch. 4). Finally, as mentioned in the previous section games are processed as entertainment, thus in line with the persuasion knowledge model (see pages 8-10) a persuasion attempt might not be obvious to the consumer.

Dynamic Advertising was launched in 2005, it offers flexibility for product integrations. In other words, if a brand pays for a placement in a film, it is permanent; in a game this is not necessarily true. Balasubramanian, Karrh and Patwardhan explain that the flexibility generates opportunities and outcomes leading to placements that are more effective than traditional ones (2006: 125). Dynamic Advertising allows brands to buy space in a new or existing game for a certain amount of time (Marketing-Vox 2008). They can be geo-targeted and contextual, which allows for the congruity of promotion and game (Ryan & Jones 2012: 256). Nelson and Waiguny use an example of product placement in Farmville as an effective use of dynamic advertising. According to Marshall (2010) Megamind was featured in a one-day campaign on Farmville, which resulted in nine million users interacting with Megamind over that 1-day campaign period. (2012: ch. 5.)

4.8 Use of Neuromarketing

Arielly and Berns ask the question hope or hype in reference to neuromarketing. There is no question that neuroscience will remain a large part of academic research in many fields, but whether it will continue in business and marketing is still up for debate. (2010: 291.) Hype surrounding the discovery of the 'buying button' in the consumers mind is mostly counter-productive and the result of media attention. Neuromarketing is an opportunity to understand more scientifically what happens in a consumers mind. It offers a new avenue in consumer research. Comparable to the introduction of neuroeconomics, there will be critics of the field. With more academic research, instead of editorials such as those in the New York Times there is an opportunity to validate an interesting field of consumer research (Arielly & Berns 2010: 291)



Neuromarketing has faced a lot of criticism in the past as well as the present. However, the scientific findings over the past decade have helped solidify the position of neuromarketing in the business community. An example of changing opinions is a leading marketing research company (Milward Brown) publicly nullifying the neuromarketing field and then changing its opinion and creating its own neuromarketing department. (Lewis, 2013: 63.)

Just as forty years ago when a single computer filled an entire room and its users hoped the reader would not chew up the punch cards, today's MRI machines are large, expensive, and noisy, but it is easy to envision them, and other neuroimaging technologies developing rapidly into powerful, portable machines (Wilson, Gaines & Hill: 394).

The Advertising Research Foundation set up an initiative to examine the credibility and commercial value of neuromarketing. In 2011 the foundation invited eight of the world's leading neuromarketing companies to join the initiative, in which every company would analyse the same eight television commercials. The reports released by the companies were then analysed by the most distinguished EEG and fMRI specialists. The deliberations concluded in:

Some of the methods and constructs used are scientifically well validated in terms of the existing neuroscience literature and peer reviewed publications... Other vendors demonstrated proprietary measures with a high correlation with marketplace outcomes even though science may not yet provide a clear foundation for the interpretation of such measures (Cited in Lewis 2013: 64)

The Advertising Research Foundation stated that the industry must undertake more scientific research and validation of neuromarketing research methods and findings (Varane 2011: 42). While the field was not validated, the report was positive in that it highlights the potential as well as setting goals for future validation. One can ask the question that isn't such an initiative in itself a sign of present and future credibility.

The success of neuromarketing in digital games entertainment is not yet apparent, but it has proven to be successful in other entertainment mediums. Ale Smidts (2002) invented the term neurocinema; the Dutch marketing expert also predicted its future



popularity. A year before Avatar was released; James Cameron claimed that fMRI machines had shown that the brain showed more activity for three-dimensional screenings than the conventional two-dimensional form (Randall 2011, FastCompany). San Diego-based neuromarketing firm MindSign received massive media coverage from the likes of Science Channel, CNN, National Public Radio and Wired magazine when they offered FMRI brain scans for people exposed to the avatar trailer free of charge. Hammou et al. is of the opinion that neurocinema is a branch of neuromarketing that has proven profitable in the business sector. (2013: 25.)

It seems that television and film production have been experimenting with applying Neuromarketing tools to measure their products. Another example is NeuroFocus working with CBS to measure responses to new TV shows and TV pilots. The company also has clients such as Citi, Google, Microsoft as well as brewers, soda companies, manufacturers, retailers and media companies. (Penenberg 2011, FastCompany.) Large corporations have invested in neuromarketing, a potential sign of growth in the field. BrightHouse was the first neuromarketing firm to have a Fortune 500 consumer-products company as a client (Thompson 2003: 56).

A study carried out by McClure, Li, Tomlin, Cypert, Montague & Montague is included in this section as it is used in countless journal papers to highlight the very potential of the field. (Fugate 2007: 388; Ariely & Berns 2010: 288; Reimenn et al. 2011: 617; Kenning et al. 2007: 145; Wilson, Gaines & Hill 2008: 393; Lee & Chamberlain 2007: 32) The experiment carried out at Baylor College of Medicine, in effect was a neural replication of the classic Coke-Pepsi taste challenge. Firstly, when there was no brand identification, respondents showed a preference to Pepsi compared to Coca-Cola. During this particular stage of the experiment the respondents' neural activity showed there was strong activity in the ventral-medial putamen within the striatum region. The region is known for being associated with seeking reward in other words good taste, and was thus consistent with the original Pepsi challenge as it showed a clear preference in taste for Pepsi. The researchers went on to test colas where one was marked Coca-Cola and the other was marked either Pepsi or Coca-Cola. The majority of the respondents preferred the coke cup. (McClure et al. 2004: 384-385.)



This deemed untrue when the table was the other way around, when Pepsi was used instead of Coca-Cola. Unlike the taste test, in the marked brand part of the experiment, most neural activity of respondents was in the medial prefrontal cortex; mostly associated with cognitive processes. More brain imaging data also showed activity in other areas including the hippocampus, dorsal-lateral prefrontal cortex and the mid-brain. (McClure et al. 2004: 384-385.) These regions as stated by Fugate "are related to emotion and affect: cognitive control, and working memory" (2007: 388). The researchers thus found that better memory of Coca-Cola, more exposure to Coca-Cola and more emotional ties to the Coca-Cola brand produced a brand recognition preference for the Coca-Cola brand that completely outshined the taste preference of Pepsi. Additionally McClure et al. found that in this case neuroimaging proved that what the respondents knew about Coca-Cola was more important than what they felt about the taste of Pepsi. (2004: 384-285) In business context, one could conclude that Coca-Cola's marketing is superior to that of Pepsi or that a brand is more powerful factor than that of taste.

4.9 Overview of Neuromarketing measurement techniques

In section 2.7.1 'direct studies' are defined as neuro-imaging techniques. As seen in table 3 the techniques include: Electroencephalography (EEG), Magnetencephalography (MEG), Functional magnetic resonance imaging (fMRI) and Positron-emission-tomography (PET). The prior two are categorized as measuring electrical activity in the brain and the latter two as measuring metabolic activity (Kenning et al. 2007: 138). The fMRI measurement technique has been used more than any other technique in neuroscience research. EEG and MEG follow and the PET is not mentioned in many research papers reviewed for this study.

According to Lee & Chamberlain each measurement tool offers its own unique view into brain activity, but that the combination of methods might result in the most interesting insights (2007: 28). For example, the combination of fMRI and Eye-Tracking seems to be widely used, to the extent that many fMRI machines have Eye-Tracking software built into the machinery itself (Lee et al. 2007: 29). The EEG testing can be coupled with eye-tracking equipment that follows where the person is looking as they experience a stimulus. The technology allows for a scientist to know exactly where the



neurological activity is occurring and simultaneously where the person's eyes are focusing at that exact millisecond. (Pradeep 2010: 12.)

Table 3. Overview of direct and indirect measures (Lee & Chamberlain 2007: 26-27; Kenning, Plassmann & Ahlert 2007: 138)

NM Techniques	Key Qualities	Strengths	Weaknesses
EDR	Detects electrical conductance of the skin associated to the level of sweat in the eccrine sweat glands as a product of the autonomic nervous system activation.	Availability, frequently used, good temporal resolution, adaptable research designs, autonomic responses more scientifically valid than behavioural or self-report methods.	Does not measure neural activity directly, link between autonomic response and brain function theoretical.
Eye-Tracking	Tracks visual attention and pupil dilation as measure of attention, arousal and valence.	Non-invasive, easy to administer, good temporal resolution, flexible in relation to research design.	Does not measure neural activity directly, link between autonomic response and brain function theoretical.
EEG	Detects electrical potential differences at scalp level that are derived from neural activity. Subjects have a number of electrodes attached to head.	Availability, non-invasive, history of use that has lead to well-accepted body of research, excellent temporal resolution.	Does not measure neural activity directly, signals have to travel through tissue and skull to surface relying on modelling of path, unable to determine exact location of activation in the brain, leads to poor spatial resolution.
MEG	Detects magnetic signals associated with electrical activity in the brain. Subjects sit in a large scanner.	Non-invasive, can directly measure signals of neural activity, means it's more durable than EEG, possibility of minimizing the inverse problem, which leads to excellent spatial resolution.	Expensive to buy, use and upkeep, still suffers from inverse problem, standardized equipment size restricts some subjects.
fMRI	Detects magnetic field distortions that are the product from changes in cortical activity. Imaging of brain function uses	Non-invasive, easy to use, capable of locating source of signal very accurately leading to excellent spatial resolution.	Expensive equipment, poor temporal resolution as signal changes occurs post-cortical activity, can be stressful for subjects due to loud noise.



	changes in oxygenated blood (BOLD contrast).		
PET	Nuclear medicine technique for analysing metabolic procedures in neurons.	Easy to locate source of signal, good special resolution.	Very poor temporal resolution, application of radioactive contrast meaning very invasive.

The indirect studies as called in section 2.7.1 and seen in table 3 include: Electrodermal Response (EDR) and Eye-Tracking. These techniques are categorized under psychophysiological measures (Lee & Chamberlain 2007: 20). The eye-tracking technique involves the use of infrared beam technology. The eye-tracking device can divulge the direction of where the eyes are looking, and also how long the eyes spend observing a certain aspect of for example an ad. The technology allows for either sitting still in front of an eye tracking device viewing a screen or a portable version of the technology which can be used for example for tracking a consumer's eyes during shopping. (Lewis 2013: 64.) As people get more physiologically excited, there is a change in the body's ability to conduct a small electrical current. Electrodes attached to the fingers can generate a sensitive sign of subconscious responses, thus measuring skin conductance; in other words a form of EDR. (Lewis 2013: 65.)

4.10 Discussion of Neuromarketing application in digital games research

The section overviews some possibilities of how Neuromarketing techniques can be applied in research of product integration in digital games. More over the section will identify areas of research that could potentially use more scientific approaches.

Firstly, based on the ideas discussed in section 4.3 (see page 30-31), entertainment media such as digital games produce a variety of emotions, which not only affect the way we process information but also how we evaluate it. With this in mind the emotion experienced while playing a game such as joy and excitement or even boredom can potentially transfer to the brand inside of the game (Gurau 2008: 727). O'Doherty (2001) claims that the OFC and VMPFC (see figure 10: 22) are linked to satisfying results and evaluation of outcomes (Reimann et al. 2011: 620). Amodio & Frith state the OFC delivers the information to the MPFC (see figure 9-10: 22), which is linked to an-



ticipated value (2006: 275). A benefit of neuroscience is the identification of such areas in the brain. In future research, with neuro-imaging marketers could conceivably measure the mentioned brain regions of a gamer for activation during a gaming session, meaning a distinctive time in which a player plays a game.

Secondly, as previously analysed creating the level of flow in a game is essential as it means that the game developer has developed a game that has an optimal challenge level for consumers. Research conducted by Arielly & Berns claims that neuro-imaging can yield insights into how consumers feel about a product experience itself (2010: 285), which in turn can be effective for customer opinion for e.g. a digital game. This might assist in creating a game that has optimal challenge for a target consumer. Zurawicki claims that a company by the name of Emotiv Systems has launched an EEG headset that detects activities in the player's mind as well as facial signals; the algorithms used by the company claim to be able to distinguish between emotions such as excitement, engagement/boredom and frustration (2010: 221).

Along side the state of flow, telepresence was highlighted earlier in the findings section as an important concept for advertisers. Because of the greater interactivity and increased vividness, as well as the possibility of increased arousal it's a concept that would be vital to be measured by researchers. Psychophysiological techniques including skin resistance measures, can measure increased arousal fluctuations. The use of EDR (see table 3: 40-41) and neuro-imaging techniques could help identify the symptoms of a player in a state of 'flow' or 'telepresence. If these states can be identified, it could assist advertisers to choose games that are suitable for product integration. Arguably, from the perspective of a game developer it could also add value to selling the advertising space. As mentioned in section 4.8 (see page 37) the fMRI technique was applied to testing avatar before its release and showed that people were more immersed in the 3-D viewing than the traditional 2-D viewing. (Randall 2011, FastCompany). Coyle & Thorson identify three-dimensional visuals as creating a greater sense of telepresence.

Thirdly, the review of memory-based measures in previous research presented the biggest opportunity for future research. Recognition, explicit memory and implicit memory have been used as measures throughout previous research. However, this



study identified the shortcomings of explicit memory. Based on the limited capacity model of mediated message processing (see page 7) most if not all of conscious processing are devoted to the playing of a game. Meaning that if there is any memory of product integrations it is most likely unconscious in nature. Traditional implicit memory tests such as fragmented word test have highlighted promise in implicit memory, but there is room for much improvement. Blanton & Jaccard have described traditional implicit psychological measures that are meant to pick non-conscious processes as arbitrary (2006: 31-32). Considering the limited capacity model of mediated message processing theory, it can be argued implicit memory is clearly a more viable research measure compared to explicit memory. Neuro-imaging allows for the measurement of non-conscious processes (Reimann et al.: 611), arguably a huge advantage for future research of implicit processing in Digital Games. Figure 8 (see page 19) is an example of how a neuromarketing researcher would test a subjects unconscious opinion of a product integration in a game in comparison to figure 6 (see page 15) in which a traditional researcher would test the conscious opinion of the subject.

There should also be consideration of 'hybrid models' as mentioned in the EU commissioned report. Lee and Chamberlain also lay the claim for better results with the use of multiple techniques (2007: 24). For example the use of fMRI and Eye-Tracking technology or EEG and Eye-Tracking technology might be effective for analysing brain processing while playing digital games. The neuro-imaging technology can pinpoint the brain region that is activated drawing lines to whether the experience is positive or negative and whether memory related areas of the brain are active. Psychophysiological such as Eye-Tracking equipment can simultaneously be utilized in recording where the consumer is looking, and for how long. This can potentially be beneficial for in-game advertising as to examine whether the player or consumer has noticed and/or paying attention to the promotion attempt. Eye-tracking should be considered because according to Mr Crook, market research indicates that 83 per cent of information retained by people is through vision. (Ellison, S. & White, E., 2000) Martin Lindstrom an expert marketer says "Emotion gets our attention through our senses – which then influence our decision making processes" (2010: 4).

Fourthly, the need for more research in congruent/non-congruent & prominent/subtle product integrations is apparent, because like most research conducted in understand-



ing advertising efficacy in digital games there are many opposing opinions. Arguably research could use the scientific approach of Neuromarketing techniques. A benefit of Neuromarketing is that it collects data without the limitations of conventional methods that have the inability of assessing consumers' motivations (Hammou et al. 2013: 20; Morin 2011: 133; Pradeep 2010: 10; Reid 2006), it has no need to ask about a customer's feeling post cognitively (Kenning et al. 2007: 136). Ariely & Berns simply explain that Neuromarketing is an exciting methodological alternative to traditional alternatives as it doesn't rely on the trust of the consumer (2010: 284) and Van Praet says, "as a rule of thumb it is better to track or observe real behaviour rather than opinion" (2012: 82)

Finally, as mentioned in the previous section games are processed as entertainment, thus in line with the persuasion knowledge model (see pages 7-9) a persuasion attempt might not be obvious to the consumer. Post-design applications of neuroimaging have mostly affirmed what is already known about behavioural effects of product integration. Basically, that unlike the counter-argument reaction that consumers have towards traditional promotion such as a television commercial, product integration bypasses that counter-argument reaction because the promotion passes as entertainment. (Ariely & Berns 2010: 288)



5 Conclusion

Embedding brands in digital games, or as we refer to it in this study as product integration, is a very interesting topic. The gaming industry is growing exponentially, and like any industry that garners such interest from such a vast variety of people, there will be increased commercial interest. The information analysed in the study highlights many benefits of this digital marketing tool, but the efficacy of any single product integration remains unquantifiable. The analysis of previous research highlights the need for more emphasis on the study of implicit memory. To understand what is happening in consumers' subconscious during the act of playing a digital game might be the key to demonstrating the efficacy for advertisers. Future researchers should consider neuro-imaging and psychophysiological tools in the effort of validating product integration in digital games. While the concept of neuromarketing is not validated, the use of scientific techniques can serve as a new window of opportunity for researchers.

In relation to marketing theory, product integration is classified as a form of advertising. In most cases the marketer's objective with the use of product integration is reminder advertising. Meaning that the goal of the advertising is to maintain relationships and keep consumers thinking about a brand or product. This is important to understand in relation to the consumer decision-making process because after the consumer has identified a problem and is looking for a solution in the form of a new product or service, he or she performs an information search. The internal information search is relevant to this study as it includes searching ones own memory. The selection of a digital game as the digital medium for a product integration thus has the objective of reminding a potential customer of a product or brand when he or she is performing the information search. A successful integration would mean that the consumer would remember the product that was integrated in a digital game he or she played and therefore selects it as a potential option for the evaluation stage of the consumer decision-making process.

Whether to select traditional media or digital media as the medium for product integration by marketers is another factor to be considered. Firstly, the benefit of digital media is an increased interactivity for consumers. The opportunity of personalizing placements for consumers is another benefit of the digital medium as well as a longer shelf-



time for the advertising. One could argue that digital marketing is much more measurable than traditional media, thus creating more statistical evidence of ROI for marketers. Finally, dynamic advertising is a key benefit of digital media. The fact that product integration can be revised or tailored during campaigns is a major benefit. Balasubramanian et al. explain that the flexibility generates opportunities and outcomes leading to placements that are more effective than traditional ones (2006: 125).

The analysis of previous research showed two methods of embedding brands into games; through an advergame classified as product immersion or an in-game advertisement classified as a product placement. As Kotler explains from the perspective of a marketer, the selection of a communication channel is important because the credibility and attractiveness of the source can effect how the consumer processes the advertising (2008: 709-710). A marketer must then consider whether a game is appropriate for a certain brand or product.

Research also showed that there are different types of gamers. Meaning that a marketer should consider the expertise of a gamer when selecting the type of digital game. For example if an in-game advertisement is to be used, a marketer might prefer a game that is played by more expert gamers. Research has shown that expert gamers have higher levels of skill thus having the attributes necessary to decode gameplay as well as perceive visual stimulus, such as product placements. Another factor that a marketer might consider when deciding whether to invest in embedding their brand or product in a game is whether the game creates the appropriate level of challenge for consumers. The analysis of prior research showed that if the challenge of playing the game meets the skill level of the player, mental states of 'flow' and 'telepresence' are created. The mental states are a sign of a player feeling as if he or she is inside the mediated environment.

A marketer should also consider the congruence and prominence of product integrations. There are opposing views in research about whether congruent or incongruent integrations are more effective. The same opposing views exist for prominent and subtle integrations. Effectively meaning that marketers will have to make such decisions based on the parameters of each individual project. Different products have different target markets, for example Nestle might prefer an advergame promoting it's chocolate



milk while Adidas might prefer an in-game advertisement in a football game such as FIFA. On the other hand Nestle might prefer an incongruent placement in a first-person shooter such as call of duty. This of course is inferring that these games offer advertising space and is completely theoretical. The need for pre-testing advertising is essential according to Spike Cramphorn (2014: 572). Figure 8 (see page 20) is an example of the process that can be carried out to test the efficacy of a product integration. Neuro-imaging people's brains before and after a promotion in relation to a brand can result in important information that is unattainable by traditional research methods.

A game player experiences emotions while playing a game; these emotions can be transferred into the opinion of the product or brand (Gurau 2008: 727). These emotions not only affect the way we process information but also how we evaluate a game. Accordingly it is vital for a marketer who has embedded an advertisement to know how the player is feeling while playing the game, for example whether he or she is excited or bored. That excitement or boredom can affect their opinion of the embedded brand or product. Since neuroscience has identified areas of the brain that are responsible for emotions, neuro-imaging might give insight to marketers about players' emotions while playing a game. As stated in section 4.10 (see page 41-44) Emotiv systems have an EEG device that decodes neural fluctuations as well as facial signals. They claim that the device coupled with their algorithms can distinguish players' emotions such as excitement and boredom.

Hybrid models, defined earlier as a combination of neuro-imaging and psychophysiological techniques could be very beneficial in researching the efficacy of integrations in games. Combining multiple measurement techniques allows for more results that can be cross-examined. For example with the use of an eye-tracking device and an EEG device a researcher can study a player who is playing Call of Duty (first-person shooter). Eye-tracking can be used to measure whether the player is looking at a product integration such as a billboard. Simultaneously an EEG device can measure what areas of the brain are active. The amygdala is an area that according to Murray is linked with the processing of emotions and according to Wise a modulator for the memory system (Reimann et al. 2011: 620). If a researcher finds that the amygdala is active while the



gamer is looking at the billboard, it could be interpreted that the player has noticed and registered the integration.

The review of memory-based measures in previous research presented the biggest opportunity for future research. Most of the research analysed for this study concentrated on studying the explicit memory of consumers. This is reasonable because existing traditional methods are more suitable for measuring explicit memory. However, this study identified the shortcomings of explicit memory. Based on the limited capacity model of mediated processing model (see page 7-8) most if not all of conscious processing is devoted to the playing of a game. Meaning that if there is any memory of product integrations it is most likely unconscious in nature. Neuromarketing emphasizes the importance of unconscious processing and memory. It presents the opportunity for future researchers to test whether consumers are registering product integrations on an unconscious level. As scientific research of the brain continues to develop, the application of that information to marketing and in specific to games and product integration can produce results that can prove the effectiveness of games as a promotional tool. It's true that "ignoring neuroimaging as a way to understand consumer behaviour would be as absurd as astronomers refusing to use electronic telescopes" (Morin 2011: 132). The fact that the White House is investing heavily in to what it call the BRAIN initiative (neuroscience research) (Whitehouse.gov) is a sign of continued development in the science of the brain.

Martí-parreño, Aldás-manzano, Currás-pérez, & Sánchez-garcía suggest that from a marketing perspective, entertainment is the key factor for digital games to be an effective marketing tool (2012: 377). A key finding is that a consumer will process a message from a non-persuasion situation differently than in a situation where the consumer feels that there is a definite attempt of persuasion (Wei, Fisher & Main 2008: 38). Thompson explains that advergaming can be used as an example of non-persuasion setting as the focus of the consumer is on the entertainment (2010: 438); d'Astous and Chartier claim that the fact that placements are natural means that there is not counter argumentation leading to a more likely positive outcome (Balasubramanian et al. 2006: 128). Traditional advertising such as a television advertisement, is a setting in which the consumer is aware of a persuasion attempt. Basically, unlike the counter-argument reaction that consumers have towards traditional promotion such as a televi-



sion commercial, product placement bypasses that counter-argument reaction because the promotion passes as entertainment. (Arielly & Berns 2010: 288)

The sources used for this study have different levels of general scientific validity. Most of the research used in this review was collected from respected journal publications and peer accepted books. However, information was also collected from magazine articles, commissioned reports, as well as from books written by neuromarketers. To a certain extent all qualitative data sources have bias, but certain sources that were used in this study were extremely biased such as Pradeep and Lewis. Generally speaking, this type of critical study has the shortcomings of relying on qualitative information as it is almost always out of its original context. A limitation in the study is that it identifies a hole in research, but fails to explain specifically how it can be researched further. More so the need for more research in implicit memory in reference to product integration in digital games is highlighted, but the actual feasibility of neuromarketing is only commented upon.

In conclusion one might consider the fact that in this increasingly technological society, a billboard in a virtual world is more valuable than one in the real world. The most key benefit of integrating a product into a game is the bypassing of the counter argumentation reaction of a consumer due to the fact that the consumer processes the promotion in an entertainment media. If researchers are able to provide evidence that a consumers' unconscious recognizes and remembers advertisements that are embedded in games, it can add a whole new commercial value to the medium. The suggestion of this study is to use neuromarketing techniques to assist in providing that evidence. Even though neuromarketing has shown considerable progress over the past couple of years, especially the fMRI (Hammou et al. 2013: 21), more research is needed for validation (ARF). Arielly & Berns are of the opinion that if neuromarketing is to compete with traditional marketing approaches, it needs to be cheaper (2010: 287) and also that the academic community should take notice of neuromarketing and not leave it to neuromarketers and journalists (291). Additionally corporations that are clients to neuromarketing companies should be open with experiments and results, so as to help with validation (Fugate 2007: 392). Fugate suggests that in the future after copious amounts of research there is the possibility of a brain function model of consumer behaviour (2007: 387). Future research of product integration in digital games should



consider the use of psychophysiological and neuro-imaging techniques, as they can provide original data that can help prove the efficacy of advertising in digital games.



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