



# Modeling the effect of self-efficacy on game usage and purchase behavior

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## ABSTRACT

This research models the relationship between self-efficacy, game purchase and usage. Four-hundred and ninety three consumers responded to a questionnaire. We deployed confirmatory factors analysis (CFA) and structural equation modeling (SEM) across 4 game types; original model (all games) and alternative models, Sports/Simulation/Driving, Role Playing Game/Massively Multiplayer Online Role-Playing Game/Strategy and Action/Adventure/Fighting. The impact of self-efficacy on usage and purchase was modeled both individually and simultaneously. For individual effects; models had adequate fit with Sports/Simulation/Driving showing an impact between self-efficacy on game usage and purchase. Our results showed no simultaneous relationship. We conclude that self-efficacy does impact usage or purchase but game type affects this relationship. Research implications are discussed.

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## 1. Introduction

Recent advances in games on PC, MAC, Console, Mobile, iPhone or iPad have increased the consumers purchase and use of these entertainment related products and services (Prugsamatz et al., 2010). According to the Entertainment Software Association in the U.S.: (1) computer and video game software sales generated \$10.5 billion in 2009, (2) sixty-seven percent of American households play computer or video games, (3) the average game player is 34 years old and has been playing games for 12 years. Overall, sales of game hardware, software and accessories have eclipsed those of the US box-office, cementing gaming as a dominant force of technological consumption (Khan, 2002; Guth, 2003). Europe has also become a significant industry and market. The UK is the third largest market globally with total sales in 2004 of entertainment and leisure software of £1.34b (Boyle and Hibberd, 2005). The interactive entertainment industry in the UK is set to grow by 7.5% between 2009 and 2012 (UKIE, 2011).

There are many factors that have fueled this change in the consumers consumption behavior but it is argued in this research that the growth in the importance of games in a consumers entertainment experience has been largely attributable to increased technology related self-efficacy (Allan, 2010). Usage and purchase has grown because the consumer perceives that they have the capability to be interactive with a game and therefore, other stimuli within the game (e.g., Advergaming).

As a consequence, marketing practitioners and researchers have become more interested in the potential of this medium for marketing. A key focus of this interest is related to three questions, that is, self-efficacy and the fit between the consumer and: (1) the game, (2) the marketing stimulus (e.g., advertisement) and (3) the co-creation of experience with the game and stimulus. All these questions place emphasis on the consumers belief in their capability to not only play the game as well as interact with the marketing stimulus to accomplish specific objectives but also to be an active player in the co-creation of experience (Bandura, 1982).

A review of the existing research shows that much of the work to date has focused on the effect of advertising within a game on the consumer (Molesworth, 2006). For example, Prugsamatz et al. (2010) apply the theory of planned behavior by gamer type, showing the effects on purchase intentions. Also, Cauberghe and De Pelsmacker (2010) replicate the effect of in game advertising on brand recall and attitude. They also take in to account the mediating effects of product involvement, although, we acknowledge that the games medium is predominately service oriented. This work is consistent with Nicovich (2005) who have measured the relationship between consumer involvement on the advertising effect. Like Cauberghe and De Pelsmacker (2010), many others have examined the advertising communication effect of product or brand placement in computer games on the consumer (e.g., Schneider and Cornwell, 2005; Mackay et al., 2009; Chaney et al., 2004; Nelson et al., 2004; Winkler and Buckner, 2006; Yang et al., 2006; Mau, Silberer and Constien, 2008). While this research has replicated traditional models, they have ignored two important factors. First, the mediating effect of the service experience and, second the difference between a product vs. an entertainment orientation.

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Recently, other researchers in an attempt to extend our understanding of the consumer response to marketing in the game environment have started to explore avatar-based advertising (Jin and Bolebruch, 2009). In this study, the overall effects of avatar-based interactive advertising on product involvement and attitude were tested. It was found that consumers “perceive human-like spokes-avatars as more attractive, and players who interact with a human-like spokes-avatar perceive the iPhone advertisement as more informative than those who interact with a non-human spokes-avatar (Jin and Bolebruch, 2009, p57).”

Despite these developments, most of the existing research has focused on the consumer- advertisement response. Many with the exception of Prugsamatz et al. (2010) have not compared different game genres. Little attention has been given to understanding the fit between consumer, game and marketing stimulus from a self-efficacy perspective and the effect of this on use and purchase. This is concerning because if a consumer does not have the belief in their capability to be interactive with the game and/or marketing stimulus concurrently, it is less likely that they will value the experience. Self-efficacy plays a key mediating role in the interactivity between consumer, game and marketing stimulus. If consumers do not have a high level of self-efficacy then this may reduce use and purchase. Also, as some researchers have argued, there may be negative impacts on the gamers self-and other aspects of cognition (Boyle and Hibberd, 2005; Anderson and Bushman, 2002; Dill and Dill, 1998).

While these perspectives are valuable for our understanding, a fundamental research question has not been addressed, such as those concerning the consumers’ self-efficacy and its relationship to game purchase and game usage (Kaltcheva et al., 2011). We model these relationships across 4 game types, grouped according to the conceptualization of Myers (1990), namely: (1) all games representing our original model and then the alternative competing models, (2) Sports/Simulation/Driving, which places emphasis on hand/eye co-ordination/reflexes in real world environments, (3) Role Playing Game (RPG)/Massively Multiplayer Online Role-Playing Game (MMORPG)/Strategy, which places emphasis on characters that gain experience and power through encounters and (4) Action/Adventure/Fighting, which places emphasis on simulations of futuristic and historical warfare and/or violent activity.

This approach is consistent with Apperly (2006, p. 20) and others (Prugsamatz et al., 2010) who argue that “strategy and role-playing genres have their roots in pre-computer forms of play, whereas the simulation genre can be compared to non-entertainment computer simulations. The action genre is implicitly connected to cinema through its deployment of the terminology of that medium to mark key generic distinctions.”

Usage and purchase are employed as dependent variables and relate to the frequency of this behavior. Usage and purchase have often been used in this capacity in marketing research. For example, Shimp and Kavaz (1984) relate the theory of reasoned action to usage. Usage has also been deployed in an experimental context. Folkes et al. (1993) relate product supply to usage. Desai and Hoyer (2000) examine the composition of memory-sets to different usage. Purchase behavior has also played a key role in marketing research as a dependent variable (Sriram et al., 2010; Hui et al., 2009; Liu, 2007). For example, Bawa and Shoemaker (1987) develop a model of coupon usage across product classes to explain the purchasing behavior between coupon-prone and non-coupon-prone households. Also, Sismeiro and Bucklin (2004) use binary probit models of navigational behavior to predict actual purchase online.

Our work has implications for current research focusing on the fit between consumer, game and marketing stimulus from a self-efficacy perspective and the effect of this on use and purchase. Through this understanding it provides an important direction for

the advertising of games and for game designers. Through a better understanding of what consumers’ value and whether it drives usage and purchase, advertising within games may well become more effective in terms of reaching communication goals such as brand recall and awareness. Product and game involvement may also increase.

This paper is organized as follows. First, we present the conceptual model which begins with a definition of the concept of the game leading to our hypotheses. The paper follows with the methodology and results. The paper concludes with the discussion, managerial and research implications.

## 2. Conceptual model

A wide variety of concepts have been applied to conceptualize the consumers interaction with games such as; narratives and interactive texts (Juul, 2001, Ryan, 2001), cultural artifacts (Prensky, 2001) and technological drivers (Woods, 2003; Bushnell, 1996; Aarseth, 2003). In the context of this research we draw from a conceptual model that defines the game from the consumers’ experience (Newman, 2002a, 2004; Manninen, 2003; Aarseth, 2003) of the consumption or play of the game (Chen, 2008; Holbrook and Hirschman, 1982). Playing a game involves instantaneous feedback in visual, auditory and kinesthetic forms. This feedback helps to create interactivity and shape the consumers experience in cognition and within the medium, create rich virtual worlds that blur the boundaries between imagination and reality (Jessen, 1999).

The process of consumption is not singular, but rather an experience that varies with the consumer and their level of interaction, both within the game and with other game players. A game has an explicit structure that defines how it is to be played (Choi and Kim, 2004), yet it is open to interpretation and experimentation. It is also a representation of the functional and recreational desires of the immediate consumer (Newman, 2002a). Eber (2001) demonstrates that the choice to interact with the game may be driven by a hedonic need. This enforces the concept brought forward by Mortensen (2002) and Fromme (2003) that the attraction of the game depends on the subjective interpretation and desire of the consumers and by their self-concept (Walther, 2003; Gottschalk, 1995).

We propose that when a consumer plays a game they experience interactivity. The effect of this feedback is to transform their perceptions of self-efficacy; the belief they hold in their capability to accomplish a task, which, in this respect refers to their ability to play the game (Agarwal et al., 2000; Bandura, 1982). In essence it changes their fundamental belief that they are capable through game play to achieve the desired goals and outcomes.

This argument is supported by Allan (2010), Bandura (1977, 1982) and Smith (2002a,b) who defines four sources of self-efficacy; mastery experiences (performance accomplishments), vicarious learning and experience, social persuasion and affective states (emotional arousal). Allan (2010, p. 36) posits; “video games can produce both positive and negative emotional arousal in those who play them. Watching another person play a video game provides the observer with vicarious experience to make efficacy comparisons. Verbal persuasion influences video game self-efficacy when a player receives feedback from others. Finally, video games are generally performance accomplishment tasks. They provide a player with a constant stream of input. This input supplies the player with ongoing mastery experience to build video game self-efficacy.”

These findings are consistent with Newman’s (2002a,b, 2004) continuum of engagement and Vorderer (2003) and Eber (2001), who define a game as a ‘form of mastery’ (i.e. the acquisition and perfection of a skill). Consequently, self-efficacy has primarily been

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