

THE EFFECTS OF VIRTUAL SPORT EXPERIENCE ON BRAND ATTITUDE AND
ATTITUDE STRENGTH

A DISSERTATION
SUBMITTED TO THE FACULTY OF THE GRADUATE SCHOOL
OF THE UNIVERSITY OF MINNESOTA
BY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

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February 2010

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February 2010

ACKNOWLEDGEMENTS

This dissertation would not have been done without the guidance, support and encouragement of many mentors, friends and loved ones. First, with a deep sense of gratitude, I would like to thank my advisor, Dr. Stephen Ross, for his guidance and encouragement during my years as a Ph. D student. His experiences and passion inspired and enriched my growth as a scholar. It was indeed a privilege to have worked with him.

I am grateful to all committee members – Dr. Michael Harwell, Dr. Eric Brownlee, and Prof. Rayla Allison – for their patience and perseverance in overseeing this document from proposal to completion. Especially I would like to thank Prof. Allison for mentoring me during my days in the Ph.D. program. She provided great opportunities to work at Sport Business Institute. These real world experiences have given me opportunities to create balanced perspectives between theories and practices.

I would also like to thank my friends for their support for my experiment. Their company made my years at the University of Minnesota productive and extremely enjoyable. Most importantly, my family members deserve a note of thanks. I feel deep sense of gratitude for my marvelous, fabulous wife Juhee, my sons Hyunbin and Hyunwoo who have supported and waited for me with everlasting love and patience.

ABSTRACT

Given that virtual experience generated from sport video gaming is closely similar to consumption experience in actual sport contexts, repetitive sport video gaming is expected to result in favorable attitudes toward a specific sport that are easily accessible from memory, held with strong confidence, and are therefore predictive of subsequent behavior. However, despite the popularity and potential of SVGs as a marketing tool, previous research on new media have ignored the possibility that playing a sport video game and its repetition may affect sport brand attitudes and behavior and also the strength of the attitude-behavior relationship.

This dissertation examined the possibility that repeated video gaming have influences on both evaluative and non-evaluative dimensions of attitudes (attitude accessibility and attitude confidence), and whether such an effect can influence the relationship between attitude and behavior. For this study, one hundred and ninety-seven undergraduate and graduate students at a large Midwestern university were recruited with a convenient sampling method. The hypotheses based on repeated exposure effect were tested using a single factor design with four conditions: single, three, and seven exposure conditions and a direct experience condition.

The results of the study provided evidence that repeated video gaming affects both evaluative and non-evaluative dimensions of attitudes toward the NASCAR brand. Repetition was found to increase liking of the brand under three and seven exposure conditions, but the increment in liking the brand was not statistically significant for the single exposure condition. In addition, the results indicated that brand attitudes based on

repeated video gaming are similar to those based on direct experience. This study also showed evidence that repeated exposure to the sport brand plays an important role in attitude-behavior consistency. The findings of the study provide researchers and marketers with benchmark data for future research to explore the potential of video games as a marketing tool for the penetration of a sport into a new market. Implications for advertisers and marketers and direction for future research were discussed.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	i
ABSTRACT	ii
TABLE OF CONTENTS	iv
LIST OF TABLES	vi
LIST OF FIGURES	viii
LIST OF APPENDIXES	ix
CHAPTER I: INTRODUCTION	1
Statement of the Problem	5
Purpose of the Study	6
Research Hypotheses	8
Significance of the Study	11
Delimitations	14
Limitations	14
Definition of Terms	16
CHAPTER II: LITERATURE REVIEW	18
Video Game as a Marketing Tool	18
Consumer Learning	22
Attitude and Attitude Strength	26
Repetition Effects	39
CHAPTER III: METHODOLOGY	44
Pilot Study	44

Main Study	52
Research Design	52
Participants	52
Procedure	54
Stimulus	56
Instruments	57
Data Analysis	64
CHAPTER IV: RESULTS	69
Demographic Profile of Participants	69
Hypothesis Testing	71
CHAPTER V: DISCUSSION	102
Summary of Main Findings and Discussion	102
Theoretical Implications	108
Practical Implications	110
Limitations and Future Research	113
REFERENCES	117
APPENDIXES	147

LIST OF TABLES

Table 3-1 Estimated marginal means of attitude accessibility	48
Table 3-2 Estimated marginal means of attitude Confidence	50
Table 3-3 Brand Choice Situations	62
Table 3-4 Scale Matrix for Variables Table	64
Table 3-5 Tests for Hypotheses	65
Table 4-1 Demographics Characteristics of Experimental Groups	70
Table 4-2 Chi-square Analysis of Gender among experimental conditions	71
Table 4-3 Chi-square Analysis of Age among experimental conditions	71
Table 4-4 Tests of Homogeneity of Regression Slopes (Pre-and Post-Attitudes)	74
Table 4-5 ANCOVA for Post Attitudes	74
Table 4-6 Means, Standard Deviations, and Adjusted Means for Pre-and Post-Attitude ..	75
Table 4-7 Test of Homogeneity of Regression Slopes (Accessibility and Familiarity) ...	80
Table 4-8 Test of Homogeneity of Regression Slopes (Accessibility and Identification)	80
Table 4-9 ANCOVA for Attitude Accessibility	81
Table 4-10 Means, Standard Deviations (S.D.), and Adjusted Means for Accessibility ..	82
Table 4-11 Polynomial Contrast Results for Attitude Accessibility	83
Table 4-12 Contrast Results for Attitude Accessibility	83
Table 4-13 Test of Homogeneity of Regression Slopes (Confidence and Familiarity)	88
Table 4-14 Test of Homogeneity of Regression Slopes (Confidence and Identification)	88
Table 4-15 ANCOVA for Attitude Confidence	89
Table 4-16 Means, Standard Deviations (S.D.), and Adjusted Means for Confidence ...	90

Table 4-17 Polynomial Contrast Results for Attitude Confidence	91
Table 4-18 Contrast Results for Attitude Confidence	91
Table 4-19 Correlation Coefficients between Brand Attitude and Behavior by Exposure Conditions	93
Table 4-20 Pairwise Comparison of Correlation Coefficients (Single Exposure vs. Direct Experience)	96
Table 4-21 Pairwise Comparison of Correlation Coefficients (Single Exposure vs. Three Exposure)	97
Table 4-22 Pairwise Comparison of Correlation Coefficients (Single Exposure vs. Seven Exposure)	98
Table 4-23 Pairwise Comparison of Correlation Coefficients (Three Exposure vs. Direct Experience)	99
Table 4-24 Pairwise Comparison of Correlation Coefficients (Seven Exposure vs. Direct Experience)	100
Table 4-25 Pairwise Comparison of Correlation Coefficients (Three Exposure vs. Seven Experience)	101

LIST OF FIGURES

Figure 3-1 Attitude Accessibility	49
Figure 3-2 Attitude Confidence	51
Figure 4-1 Scatterplots between Pre-and Post-Attitude for each group	73
Figure 4-2 Estimated Marginal Means of Post-Attitude	76
Figure 4-3 Scatterplots between Accessibility and Familiarity for each group	78
Figure 4-4 Scatterplots between Accessibility and Identification for each group	79
Figure 4-5 Estimated Marginal Means of Attitude Accessibility	84
Figure 4-6 Scatterplots between Confidence and Familiarity for each group	86
Figure 4-7 Scatterplots between Confidence and Identification for each group	87
Figure 4-8 Estimated Marginal Means of Attitude Confidence	92

LIST OF APPENDIXES

Appendix A: Recruitment E-mail	147
Appendix B: Consent Form	148
Appendix C: Pre-Test Questionnaire	150
Appendix D: Main Survey	152

CHAPTER I: INTRODUCTION

In the media-saturated climate of the modern age, marketers and advertisers have been searching for a unique and effective medium to communicate with consumers about their products and services. With the strategic idea of advertising-as-entertainment, entertainment marketers and advertisers have begun to consider videogames as a popular component of advertising and promotional strategy, by incorporating brands within interactive games (Chaney, Lin, & Chaney, 2004; Ferrazzi, Chen, & Li, 2003; Nelson, 2002). With this goal of media strategies in mind, many sport organizations (e.g., NFL, NBA) are dedicated to developing videogames in order to create a more interactive and integrated communication tool for reaching existing sport fans, new fans and younger generations (Arrington, 2003).

Given the development of new audio-visual technologies and the increase in licensing arrangements, sport video games (SVGs) modeling real life sports have become more realistic and similar to the sport images of traditional media outlets such as television or radio. Real-life game situations and players' movements are portrayed very accurately in video games. In addition, the possibility to tailor and alter the properties of games (e.g., game setting) allows gamers to examine the visual images and features of sport brands (e.g., players, teams, leagues) in a variety of ways, enabling them to inspect real-life sports, much like they can via television or Internet, by controlling the focus and pace of an inspection. In this way, Coakley (2003) suggested that 'sport video games enable videogame users to feel their initial emotional experiences in a certain sport in front of their televisions rather than on playing fields.'

In consumer psychology literature, many studies have emphasized the role of experiences with products and brands in consumer learning, focusing on direct experience (e.g., product trial) and indirect experience (e.g., advertising). Direct experience (DE) involves the interaction of a product with the consumers' full sensory capacity, whereas indirect experience (IE) is generated without actual product contact or use (Gibson, 1966; Li, Daugherty, & Biocca, 2001; 2003). Generally, direct experience generated from actual product contact or consumption is perceived as more credible and memorable than indirect experiences such as advertising (Smith & Swinyard, 1982). Most of the current research on consumer behaviors has accordingly agreed that attitudes formed as results of direct experience predict behaviors better than attitudes based on indirect experience (Li, Daugherty, & Biocca, 2001; 2003).

As technological advances in media enable multi-sensory interactions with products in the e-commerce environment, many researchers have recently conceptualized the new type of consumer experience as virtual experience (VE). Li, Daugherty, and Biocca (2001, p. 14) define virtual experiences as "psychological and emotional states that consumers undergo while interacting with products in a 3-D environment." They also emphasize the similarity between VE and DE with respect to interactivity and vividness. McLuhan (1988) suggests that within the advanced media environment, there are fully developed points of interaction and connection between the human operator, the technology, and environment that serve to immerse users. Consumers are able to experience enhanced psychological states because the medium creates a sense of interactivity and enjoyment resulting in increased learning, altered behaviors, and a

perceived sense of control (Hoffman, Novak, & Duhachek, 2003). Thus, it is plausible that experiences occurring while using SVGs are capable of creating psychological states that influence cognitive and affective behavior. This new type of experience such as a simulation of sport experience in real life can be construed to fall on the continuum of consumer learning ranging between indirect and direct experience (Lee & Li, 2005; Li, Daugherty, & Biocca, 2001; , 2002; , 2003).

As VE generated from a mediated environment is closely similar to DE, the attitudinal effects of VEs have attracted a considerable amount of attention in the fields of marketing and communication. Generally, attitude constructs have served as independent variables in studies examining media effectiveness (see Lee & Fabor, 2006; Nelson, 2002). The popularity of this approach is derived from the assumption of a strong attitude-behavior relationship, although researchers have generally failed to provide strong evidence that attitudes are good predictors of behavior (Fishbein & Ajzen, 1975; Wither, 1968). As a result, researchers have approached the attitude-behavior relationship from a moderator variable perspective, focusing on the structure of attitudes in memory: non-evaluative dimensions of attitudes, such as attitude accessibility or attitude confidence (Fabrigar, Macdonald, & Wegener, 2005). The work of researchers such as Fazio and his colleagues has provided impetus for researchers investigating the impact of attitudes on behavior (Fazio, 1986; Fazio & Zanna, 1978; Fazio & Williams, 1986).

Fazio and his associates have proposed a model of the attitude-to-behavior process that focuses specifically on the accessibility of the attitude from memory (Fazio, 1986; Fazio, Powell, & Herr, 1983). According to the Fazio model, attitude accessibility

is a function of the associative strength of the attitude object and the evaluation that the individual holds of the object. That is, attitudes are characterized as object-evaluation associations and the strength of the association acts as a determinant of the accessibility of the attitude. The stronger the association, the greater the likelihood that the evaluation is activated spontaneously upon the individual's encountering the attitude object. With this moderator approach, non-evaluative dimensions of attitudes are thought of as important moderators of attitude-behavior consistency, and several variables that moderate the relationship between attitudes and behaviors have been identified empirically. These variables include attitude confidence (Fazio & Zanna, 1986) and attitude accessibility (Fazio, 1986).

Given the interactive and realistic aspects of video games, SVGs have the ability to serve as a more powerful medium for communicating the details and experience of a specific sport than traditional media (e.g., TV, radio) in the sense that consumers are able to interact with sport brands and the sport itself in a mediated environment, thus simulating consumption experience. Considering the similarity between virtual and direct experience in terms of creating the sense of being in an environment, virtual experience allows consumers to assess product performance and reduce consumers' perceived risk prior to actual consumption (Klein, 2003), resulting in a high level of attitude confidence in making a brand choice. Furthermore, through sport video gaming, repeated exposure to sport brands (e.g., NASCAR, NFL, and NBA) is expected to result in attitudes toward a specific sport that are more easily and rapidly accessible from memory, held with more

confidence, and are therefore more predictive of subsequent behavior than a single exposure to sport brands (see Berger & Mitchel, 1989).

Statement of the Problem

Given the popularity of SVGs, there are a number of benefits for sport marketers in terms of opportunities to create an interface between the human operator and a computer. That is, in a virtual environment, sport fans can develop an emotional bond with a sport team or athlete by closely identifying with the cyber athlete on the video screen (Kim & Ross, 2006). Furthermore, sport experience in a virtual environment enables newer fans to increase knowledge related to a specific sport, as well as exposure to sport brands. Accordingly, SVGs are believed to create strong beliefs and more favorable brand attitudes by facilitating consumer learning from vivid and interactive experiences with sport brands such as players, teams, and sporting events (Kim, Lee, & Ross, 2006). However, despite these perceived benefits of SVGs as a marketing and promotional tool, little empirical research to date has been conducted on the sociological and psychological aspects of gamers who engage in SVG play, or on the attitudinal effects of SVGs. All the published material on SVGs has been written by game developers as parts of videogame advertising campaigns. This literature provides practical suggestions on how to use SVGs as marketing tools for sport organizations, but does not advance theory-based explanations of how consumers respond to virtual sport experience, or how virtual experience can influence the formation of brand attitudes.

To date, the academic research on video games has been limited to in-game advertising, rather than focusing on a SVG which itself advertises a specific sport or a

sport league. Furthermore, a majority of the research on the effects of videogames on consumer behavior has focused on traditional measures of advertising effectiveness, such as brand awareness, brand attitude, and purchase intention. However, considering the similarity between DE and VE generated from the latest visual-audial technology, Li, Daugherty, and Biocca (2003) suggested the need to employ non-evaluative measures of attitudes for capturing the effect of virtual experience. Despite their suggestion, it is unknown if virtual sport experiences have an influence on non-evaluative dimensions of attitudes. Thus, this study proposes to extend the research in this specific domain.

While previous research has attempted to examine the effects of video games on brand attitude and behavior, the studies have failed to achieve a more realistic exposure environment within the confines of an experimental setting. For example, the study conducted by Nelson et al. (2004) was designed to measure attitude and intention to purchase brands embedded in the video game following one time video game play. However, in the real world, a large number of game players play the same game repeatedly, progressively improving until they master the game. Thus, more research is needed to understand the impact that repeated experience in game playing could have on attitudes and behaviors.

Purpose of the Study

This study attempts to extend scholarly inquiry into the effectiveness of virtual sport experience in SVGs. Specifically, the purpose of this study is to examine the effects of virtual sport experience on brand attitude, attitude accessibility, and attitude

confidence. The study focuses on the repetitive exposure to a certain sport upon which a SVG is modeled and the attitudinal effects of virtual experience.

Additionally, to fully understand the effects of a virtual sport experience on the real-life sport brand attitude and the role of virtual sport experience in consumer learning, the unique and distinctive characteristics of SVGs that distinguish them from other media (e.g., TV) will be empirically explored. Lastly, this study tests whether video gaming can influence brand choice behavior with repetitive exposure to a brand.

In sum, this study seeks to answer relationships in the following domains, using a NASCAR racing video game as stimulus:

1. The impact of virtual sport experience on attitude strength in comparison with direct experience.
2. The impact of repetitive exposure to a certain sport on brand attitude, attitude accessibility, and attitude confidence.
3. The moderating effects of attitude accessibility and attitude confidence in the strength of the attitude-behavior relationship.

To understand more clearly how consumers evaluate a specific sport in a virtual environment and how exposure to the sport occurring with game playing influences memory for and attitudes toward the sport brand, it is necessary to explore the effects of virtual experience on attitude accessibility, attitude confidence, and attitude-behavior consistency with repeated experience in game playing.

Research Hypotheses

Studies of the "mere exposure effect" have shown that repeated exposure to stimulus results in a consumer's favorable attitude toward the brand as affect toward the given stimulus occurs. When objects are presented to an individual on repeated occasions, the greater exposure is capable of making the individual's attitude toward these objects more positive (Zajonc & Markus, 1982). Similarly, Cox and Cox (1988) noted that people often like stimuli more as a result of repetitive exposure. The repetition effect has been replicated and proved by a number of studies (e.g., Anand, Holbrook, & Stephens, 1988). Generally given that "the exposure effect is a basic process in preference and attitude formation and change" (Zajonc & Markus, 1982), repetition would be expected to increase the memory for a given brand in consumers' minds, and then result in consumer positive evaluation of the brand. Accordingly, the following hypothesis is offered:

H1: Increased exposure to a specific sport while playing video games will lead to a consumer's favorable attitude toward the sport.

As mentioned earlier, Fazio and his colleagues have proposed a model of the attitude-to-behavior process initiated with the attitude accessibility. A number of studies have attempted to enhance the strength of the object-evaluation association by inducing individuals to be exposed to an attitude object repeatedly. Berger and Mitchell (1989) provide empirical evidence to support this view. They examined the effects of advertising repetition on several non-evaluative dimensions of attitudes. Their findings indicate that repetition helps increase the accessibility of attitude toward a specific brand in consumers' minds. Based on this, one would expect repetition to enhance the likelihood

that the attitude will be activated automatically from memory upon the individual's mere observation of the attitude object (Fazio et al, 1983; Fazio, Sanbonmatsu, Powell, & Kardes, 1986). In line with the preceding literature and reasoning, repetitive exposure to a certain sport while playing a SVG might therefore be expected to influence attitude accessibility, especially when an individual is highly motivated to consider the sport as a brand in evaluative terms.

Based on the preceding literature and discussion, the following hypothesis reflects this proposition:

H2: Greater repetitive exposure to a specific sport brand embedded in a SVG will lead to more accessible attitude toward the sport brand.

Despite what was mentioned previously in advertising repetition literature, after a number of repetitions of the same video game, individuals may cease to process the information about the sport after which the video game is modeled in evaluative terms. Under these conditions, individuals may cease to activate the association between the object and its evaluation. Repeated exposure to brands embedded in a SVG may also influence other non-evaluative dimensions of attitudes. Particularly, it may increase attitude confidence. One reason for increased confidence might be that repeated exposure to a sport itself in SVGs allows individuals to process more information about the sport. This confidence reflects a consumer's certainty in judgments regarding which brand to choose (Laroche, Kim, & Zhou, 1996). Many studies of decision-making have found that attitude confidence (i.e., choice confidence) is positively correlated with the amount of and the credibility of information increases (e.g., Laroche, Kim, & Zhou, 1996; Oskamp,

1965). Another potential reason is that the attitudinal decision repeatedly made about a brand may increase the perception of consumers' confidence in their brand attitudes.

Einhorn and Hogarth (1978) provide evidence that confidence in judgments increases as a function of how often the decision is made. Furthermore, repeated exposure may induce individuals to do more cognitive activity related to given objects. In line with the above reasoning, it is hypothesized that brand attitudes formed as a result of more repetitive exposure are more confident than brand attitudes formed in response to single or less exposure. Accordingly, given that sport video game experience is interactive and repetitive in a pleasurable setting, the following hypothesis reflects this proposition:

H3: Greater repetitive exposure to a specific sport brand embedded in a SVG will lead to more confident attitude toward the sport brand.

Based on the previous findings of the effects of repetition on non-evaluative dimensions of attitude as a moderator between attitude-behavior relations, it is hypothesized that attitudes formed as a result of mere repetitive exposure in virtual contexts are also more predictive of subsequent behaviors (see Petty, Cacioppo, & Schumann, 1983; Schumann, Petty, & Cacioppo, 1986). That is, attitude-behavior consistency may increase as attitude confidence and accessibility increase. Because this approach represents a new perspective on repetition effects in virtual context, it seems that attitudes formed or changed from virtual experience with multiple exposures are as accessible and confident as those formed in direct experience. Thus, it is expected that attitudes formed in virtual experience can predict behavior. This leads to our forth hypothesis:

H4a: Enhanced attitude accessibility in virtual experience will moderate the relationship between attitudes and behaviors.

H4b: Enhanced attitude confidence in virtual experience will moderate the relationship between attitudes and behaviors.

Significance of the Study

This study will make contributions to the existing literature on the effects of new media such as video games, and sport marketing literature by attempting to extend the results found by previous researchers. It will also seek to understand the effects of SVGs on attitude toward the real-life sport brand not studied by previous researchers. Greater understanding of the virtual sport experience generated in playing videogames would benefit sport researchers and marketers who are eager to unravel the potential of SVGs as marketing tools to create and enhance brand image and attitude.

First, this study will contribute to the attitude literature which has examined attitude-behavior consistency (e.g., Fazio & Zanna, 1986). To date, a majority of the research on the effects of video games on consumer behavior has focused on traditional measures of advertising effectiveness, such as brand awareness, brand attitude, and purchase intention. The adoption of standard valence/evaluative dimensions of attitude as indicators of advertising effectiveness has been a common practice in advertising and consumer behavior literature (e.g., Nelson et al, 2003). However, Li, Daugherty, and Biocca (2003) suggest that standard measures of attitudes (i.e. valence/evaluative measures) may be inappropriate for capturing the effect of virtual experience, as virtual experience is closer to direct experience. Thus, it is imperative to examine the effect of

virtual experience on non-evaluative dimensions of attitude. The findings of the study will provide important implications for the effects of virtual experience on the formation of accessible and confident brand attitude.

Second, the current study will extend the line of research on the attitudinal effects of repetitive exposure to a stimulus, focusing on the effects of SVGs on brand attitude. A number of studies have attempted to describe mere exposure effects in various contexts. For example, Zajonc and his colleagues have provided the evidence that mere exposure increases favorable attitudes under either pleasant or unpleasant circumstances by using foreign words as stimuli (Saegart, Swamp, & Zajonc, 1973). However, these studies have never examined whether increased exposure to stimuli results in favorable attitudes toward those stimuli in a virtual context. Thus, the current study will focus on the impact of repetition on measures of attitude toward real life sports embodied in videogames.

In addition to the theoretical implication for scholars, the findings of this study could potentially provide sport marketers with clear ideas of how to use SVGs as marketing and communication tools to market real life sports. With the popularity of SVGs, issues regarding how to effectively use SVGs become important to sport marketers and organizations such as professional sport leagues and college sports governing bodies. Although sport marketers consider SVGs as an interesting alternative to traditional marketing communication tools, they have passively attempted to develop appropriate marketing strategies to market their leagues and sports through SVGs because of the lack of confidence in the effects of videogames on attitude or behavior.

The findings in the current study will provide important implications for the global market place as well. Many sport economists have highlighted the significance of sport globalization for a sport organizations' long term fiscal success and survival (Mahony & Howard, 2001). As SVGs become a popular form of entertainment around the world, issues regarding how to use the videogames effectively as a marketing tool have begun to be discussed. Specifically, penetration of a sport into new global market where that sport is not popular (e.g., the NFL and NHL in Asia) and how to measure the effectiveness of the SVG on attitude toward sport brand have become increasingly important to sport marketers. This study may be useful to global sports marketers who want to increase worldwide brand awareness and enhance brand attitude through SVGs given that the video game-playing experience is repetitive and interactive in a pleasurable way. The constant and repeated exposures make it more likely that the brand will make a lasting impression on the video game player. As such, it is believed that video games have the potential to increase brand awareness (Kim, Walsh, & Ross, 2008; Park et al., 2007). The effects of SVGs are especially important in the light of the recent interest in the subject of brand equity (e.g., Gladden, Milne, & Sutton, 1998; Gladden & Milne, 1999; Ross, 2006). Therefore, for sport marketers, a complete understanding of the effects of SVGs is essential when they must select specific media vehicles to convey a message effectively.

The findings emerging from this study will provide important evidence that videogames influence attitude formation and attitude strength. Armed with this information sport marketers can then develop marketing communication strategies

through SVG and measure the effectiveness of the SVG on attitude toward sport brands. As such, this study represents one of the first attempts to understand the effectiveness of SVG with empirical evidence, and will serve as a benchmark study that will spark future research in this growing area of sport and marketing.

Delimitations

External validity refers to the extent which research findings may be generalizable to a target population (Harwell, 2004). The main delimitation of this study was a convenience sample. Given that college students are significant consumers and users of sports and SVGs, they are identified as a target population for this study. However, a student sample at a large Midwestern university selected, due to the limited resources of the researcher, is not considered to be representative of the target population, the overall population of students in the United States. Therefore, the generalizability of the findings from this study may be limited to students at a large Midwestern university.

Second delimitation was the use of only one video game, i.e. a NACSCAR themed video game. The use of NASCAR as a SVG has been viewed as appropriate in experimental design. Although the choice of the game seems appropriate for this study, the game is probably not representative of all SVGs. Thus, the generalizability of the findings from this study may be limited.

Limitations

The present study contains limitations that are beyond the research control. First, this study focused on virtual sport experience with a specific sport after which the video game is modeled. However, there is a variety of sport brands (e.g., players, teams, and

leagues) embedded in SVGs. As such, any generalizations that can be made from the results produce different results when focusing on other sport brands (e.g., players, teams etc.) rather than a sport itself. Second, a NASCAR game was used for virtual sport experience in this study. Selecting the video game was necessary in order to give all participants, regardless of gaming skills, opportunities to join the experiment. However, this may have influenced on participant responses because some participants have played video games in a similar video game category. For example, a participant may have been more interested in the video game itself rather than a specific sport if she/he plays a racing game more often.

Third, measuring brand preference rather than actual purchase behavior was a limitation. While previous research has demonstrated that brand preference can be a valid and reliable predictor of actual brand choice behavior, college students still may not actually purchase the sport products used in the study. For example, although the participants in this study have a preference for officially licensed products from their favorite sports, they may eventually decide not to purchase sport products in real choice settings regardless of their brand preference due to convenience or lower prices than competitors.

The final limitation was the use of immediate measurement on attitude recall from memory. The experiment forced participants to recall their brand attitude after they played the video game or watched the pre-recorded NASCAR event in order to avoid problems caused from experiment fatigue. Immediate measurement made it necessary to ensure that participants could complete the experiment in a reasonable amount of time.

However, any generalizations that can be made from the results produce different results when focusing on long term effects of video gaming (e.g., players, teams etc.) rather than its immediate effects.

Definitions of Terms

Attitude: A learned association between an attitude object and its evaluation (Fazio, 1995).

Attitude accessibility: The likeliness that an attitude will be activated or retrieved from memory automatically when the attitude object is encountered, that is the strength of the association (Fazio, 1986; , 1995; Fazio, Chen, McDonel, & Sherman, 1982).

Attitude confidence: An individual's belief that her or his evaluation is correct in making a judgment about an object (Berger, 1992).

Direct Experience (DE): Experience generated from an unmediated interaction with a product or brand in human sensory channels, including visual, aural, olfactory, and taste-smell.

Emotions: Subjective feelings or felt experiences as verbally expressed by the individual (Stout & Lecken, 1986).

Experience: An event in which consumers undergo psychological and emotional states that result from the interaction with an object or environment, leading the accumulation of knowledge and skills (Lundh, 1979).

Indirect Experience (IE): Experience generated through passive exposure to products or brands in a mediated environment.

Interactivity: The extent to which users can participate in modifying the form and content of a mediated environment in real time (Steuer, 1992)

Presence: The natural perception of an environment (Steuer, 1992), that is, the direct experience of reality.

Telepresence: The mediated perception of an environment created by a computer or other media (Steuer, 1992)

Virtual Experience (VE): Psychological states that consumers undergo while interacting 3-D advertising for products in a computer-mediated environment (Li, Daugherty, & Biocca, 2001).

Virtual Environment: An environment which is artificially constructed in any communication medium (Kim & Biocca, 1998).

Virtual Sports: Sports in electronic environments in which the user has active participatory experience by closely identifying with the character on the screen and controlling over the character's actions through the use of interactive devices (Kim, Walsh, & Ross, 2008).

Vividness: The representational richness of a mediated environment as defined by its formal features; that is, the way in which an environment presents information to the senses (Steuer, 1992)

CHAPTER II: LITERATURE REVIEW

The video game industry has grown at a tremendous rate over the past decade. From 1996 to 2008 computer and video game sales have grown from \$2.6 billion to \$11.7 billion ("Top 10 industry facts", 2009). This growth is also evidenced by the fact that in 2004 sales of digital game items exceeded movie theatre box office receipts in the US market for the first time (E-Strategic Research, 2005). Also, it has been reported that 40% of U.S. households now own at least one type of video game system (Entertainment Software Association, 2005). Clearly, video games have thus become a popular entertainment phenomenon.

Videogames as a marketing tool

Given the growing popularity of videogames as a form of entertainment, marketers and advertisers have begun to consider videogames as a popular component of advertising and promotional strategies by incorporating brands within interactive games (Chaney, Lin, & Chaney, 2004; Ferrazzi, Chen, & Li, 2003; Nelson, 2002). For example, the Miller Brewing Company, one of NASCAR's sponsors, created a Miller Lite-branded Virtual Racing League (VRL) game emulating NASCAR in order to closely associate the Miller brand with NASCAR and the sport's younger fans. According to technology research firm The Yankee Group, \$70 million in advertising revenue was generated via in-game ads in the U.S. in 2003, and that number is predicted to increase to \$92 million by 2008 (E-Strategic Research, 2005).

Despite the practice and popularity of using video games as a communication and marketing tool, research on this topic is in its infancy stage. Nelson (2002) was the first to

examine recall of product placement found within a simulated racing game. The results indicated that 25-30% of brands that appeared in the game were recalled in the short term, and 10-15% were recalled after a five month delay (Nelson, 2002). Schneider and Cornwell (2005) also researched this topic and determined that prominent banner placements within games resulted in higher recall and recognition than subtle placements. Further research by Nelson, Keum, and Yaros (2004) aimed to determine consumer attitudes towards in-game advertising as well as purchase intentions towards the brand which appeared in the game. The researchers found that in general most consumers had positive feelings about in-game advertising when it adds realism to the game, and those that had negative feelings about in-game advertising were negative about the practice of advertising in general (Nelson, Keum, & Yaros, 2004). Therefore, placing a billboard around a track in a race simulation game (e.g., NASCAR 2007) would invoke positive reactions as billboards are commonplace at an actual NASCAR track (e.g., Chicagoland Speedway). In addition, their research determined that some players reported purchasing brands that they learned of through game play (Nelson, Keum, & Yaros, 2004). Although the previous studies showed the potential of video games as a marketing tool, the research on video games had been limited to in-game advertising, rather than focusing on sport brands embedded within the game (e.g., NFL, NBA, & NASCAR) and the individuals who play SVGs.

Potential of Sport Video Games as an Advertising medium

Given the growing popularity of sports around the world, many video games have been closely connected with sport content or specific athletes. Sport video game (SVG) titles dominate the industry in the United States (Adams, 2005; Arrington, 2003; Kushner, 2002; Wingfield, 2005), representing one-fifth of the 245 million games sold in 2004 ("2004 Essential Facts ", 2004). SVG play is spread across a wide age spectrum, and a variety of generations (Kim, Walsh, & Ross, 2008).

With the demographic information of sport video gamers, SVGs are believed to lend several advantages for sport marketers and advertisers. First, the SVG may help enhance consumer awareness for sports brands. The video game-playing experience is repetitive and interactive in a pleasurable way. The constant and repeated exposure makes it more likely that the brand will make a lasting impression on the video game player. Increased brand awareness may result from the interactive role between the gamers and games, which can enhance gamers' involvement in the brand (Coupey, 2001). Thus, the games may serve to stimulate brand awareness and involvement with sports brands.

Second, the SVGs provide gamers with opportunities to learn sports. SVGs emulate the 'real world' environment at sporting events with information about sport brands. As such, cyber athletes' movements are based on statistics of real-life athletes. For example, the NASCAR video game allows users to manipulate their car and compete in a league of 43 cars, which mirror the number of NASCAR competitors in real life, as well as the chance to paint it and hire a driver and pit crew. Accordingly, it could be that

gamers who are unfamiliar with an actual sport learn rules and strategies by playing SVGs. Thus, it is expected that video gamers, but not sports fans, can be taught and introduced to a specific sport itself and the moves involved in a sport during playing the games.

Finally, SVGs may reinforce sports brand attitude in a compelling way. One of the primary motives for playing SVGs is entertainment (Kim & Ross, 2006). As proposed by Ward and Hill (1991), consumers' moods that are favorable while playing promotional games may lead to favorable attitudes toward products and brands embedded in the game. With the fact that most sport video gamers are highly identified sports fans (Kim, Walsh, & Ross, 2008), the results of these studies lead to speculation that a positive sports experience in real life may impact the attitude toward SVGs in a favorable way, and thus the pleasure generated from video gaming may transfer to a positive attitude toward the actual sport. It is worthwhile to note that gaming experience in pleasurable ways may lead to positive attitudes toward the game and the promoted brand. In other words, the SVG experience may reinforce the actual sport brand images.

This type of communication strategy is similar to the traditional use of advertising to reach a broad audience. Traditionally, advertising is used to inform, persuade, and remind consumers, as well as to reinforce their attitudes and perceptions (Armstrong & Kotler, 2001). The major function of advertising is very similar to that of SVGs in terms of providing information about a specific sport and virtual sport experience, and reinforcing brand image.

Consumer Learning

How consumers learn has drawn increased interest among consumer researchers and marketers. Understanding how consumers learn is a starting point to understand how to teach them about products and their potential benefits. From a marketing perspective, consumer learning can be defined as any process by which individuals acquire knowledge about products or service from information processing or from experience (Li, Daugherty, & Biocca, 2001; 2003). Consumer learning as a process continually evolves and changes from newly acquired information. The primary goal of effective marketing communication strategies is for consumers to prefer and differentiate their products from competitive offerings. Marketing strategies are based on communicating with the consumer directly or indirectly.

Consumers learn about products and services through one or both types of experience: direct experience (e.g., product trial) and indirect experience (e.g., advertising) (Deighton, 1984; Hoch & Deighton, 1989; Li, Daugherty, & Biocca, 2003). Experiences can be classified based on the degree of possible interaction with products and the quality of the information transmitted to human sensory channels. Previous studies have concentrated on two main types of experience in consumer learning: direct experience and indirect experience.

Direct experience and indirect experience

Direct experience involves an unmediated interaction with a product in human sensory channels, including visual, aural, olfactory, and taste-smell. Direct experience can occur from various sources such as product trial and use of products (Gibson, 1966).

Traditionally, consumers consider direct product experience as the best source of product information, “experience is the best teacher” (anonymous). Given that direct experience is the optimal method to learn, Hoch and Deighton (1989) indicate the advantages associated with direct experience for consumers and marketers. First, consumers tend to be motivated to learn because of the self-generated nature of direct experience. Second, for consumers, sensory information obtained from actual product contact is the most trustworthy. Third, direct experience promotes better memory because information acquired by experience is more realistic and concrete. Finally, consumers can control over a variety of ways to inspect products by controlling pace of an inspection. Accordingly, learning from direct experience is more likely to influence attitude-behavior consistency (Fazio & Zanna, 1981; Smith & Swinyard, 1982), considering a critical factor in determining brand beliefs, attitudes and purchase intentions (Kempf & Smith, 1998; Marks & Kamins, 1988).

Indirect experience is generated through passive exposure to products or brands in a mediated environment, for example, word of mouth, consumer reports, or advertising. Advertisements are the most prevalent form of marketing communications. Many previous studies have explored the role of advertising in consumer learning (Deighton, 1984; Hoch & Deighton, 1989; Li, Daugherty, & Biocca, 2003). Advertising is believed to offer several unique benefits for consumers, advertisers and marketers. First, advertising provides an opportunity to learn about a product. As a cue, an advertisement may remind consumers of the product needed in the near future through information about where to buy and how to use it. As such, informative advertising is used to tell the

market or target audience about a new product by describing available services. It also can help consumers' understanding of products by providing the most important product information in a short amount of time. In addition, advertising helps enhance brand awareness. Specifically, repeated exposure to a persuasive message results in increasing brand memory such as recall and creates favorable attitudes toward promoted brands (Deighton, 1984; Hoch & Deighton, 1989; Li, Daugherty, & Biocca, 2003) and enhances consumers' understanding of products and services. Using advertisements, marketers expect persuasive messages to be noted, believed, remembered, and recalled in consumers' memory.

Even though marketers benefit from an advertising, in general, consumers tend to consider information in advertising as a biased form of communication, and often perceive it as a less credible source (Hoch & Ha, 1986). Furthermore, advertising shown in traditional media can conduct only a one-way communication with consumers, who tend to try to avoid advertising because of its intrusive nature (Schiffman & Kanuk, 2010). Unlike learning generated from passive observation with advertising, learning from a direct experience with actual product contact is believed to be more credible than an indirect experience.

Virtual experience

More recently, the advance of audio-visual technology enables consumers to simulate direct experience with a product in 3-D multimedia environments. The new form of experience, known as "virtual experience", has recently emerged in communication and consumer behaviors literature. Heeter (2000) noted that virtual

experience is placed between the spectrums of consumer experience from indirect experience to direct experience at the end of the continuums. Virtual experience is similar to indirect experience in terms of a mediated experience that can be provided to a larger audience (Edwards & Gangadharbatla, 2001; Heeter, 2000). Like traditional forms of advertising, 3-D product visualization enables consumers to form a prior hypothesis by framing the most important product information. In the mediated environment, consumers can store product related information in memory through the cognitive activity.

Different from indirect experience, virtual experience is able to offer user control over the inspection of a product. The possible user control and interaction with products are major advantages associated with direct experience. In fact, the ability to control information leads to the improvement of consumer decision quality and knowledge (Ariely, 2000). Nevertheless, as opposed to direct experience, virtual experience is depending on the limited sensory input.

Virtual experience is closer to direct experiences such as product trial with respect to vivid and interactive experience with products (Li, Daugherty, & Biocca, 2003). As such, virtual experience is more likely to generate a rich experience equivalent to direct experience, as well as advantages of indirect experience, such as information presentation. Thus, virtual experience may take the advantages of both types of direct and indirect experience (Li, Daugherty, & Biocca, 2003).

In an exploratory study, Li, Daugherty and Biocca (2001) identified key characteristics of virtual experience by asking subjects to verbalize what they were

thinking and feeling while interacting with 3- D products in an ecommerce environment. The results reveal that psychological and emotional states that consumers undergo while interacting with products in a 3-D environment are very similar to those shown in direct experience. They found that consumers feel a sense of presence while interacting virtual products in e-commerce setting. Additionally, they identified key characteristics of a virtual experience and examined the relationship between media characteristics and virtual experience.

Attitude and Attitude Strength

Attitudes

Attitude has long been one of the most frequently studied topics by social scientists, psychologists, and other field researchers. Throughout the history of studying attitude, the attitude construct has been defined in a variety of ways according to the scholar and time (Fishbein & Ajzen, 1972). Despite the large number of definitions, the classic concepts of attitude can be summarized from three basic features: consistency, predispositions, learning. According to the learning theory of Hull (1943), it is assumed that attitudes are obtained through the process by which a given response becomes associated with a given stimulus, in that attitudes are learned. With regard to the stimuli-response consistency, attitudes are expected to consistently make the same response to a given stimulus object. In discussing the notion of predispositions as the major feature of attitudes, it is assumed that attitudes influence behavior. Based on three notions above, an attitude is defined as “a learned predisposition to respond in a consistently favorable manner with respect to a given object” (Fishbein & Ajzen, 1975, p6).

Emotion and Affect.

In attitude research, the basic assumption is that an attitude reflects a person's feelings toward the object and can be measured on an evaluative continuum ranging from positive to negative or favorable to unfavorable (Fishbein & Ajzen, 1975; Petty & Cacioppo, 1981). As such, attitudes have been conceptualized on the basis of emotion or affect toward an object. Although emotion is the single most important property of attitude, there is still little agreement among academic authorities on what it is or how it works on attitude formation and consumption experience.

In contemporary consumer psychology and behavior literature, there are two major perspectives on emotion: one is that emotional responses are preceded by prior cognitive processes and the other is that emotion can occur without cognition. From the former perspective, Anderson (1983) depicted attitudes result from a cognitive decision-making process. According to the Cognitive Appraisal Model, Holbrook and O'Shaughnessy (1984) portrayed that the emotional process begins when a "message, object, or event triggers a cognitive appraisal that results in an evaluation mediated by beliefs and shaped by personal values." In other words, cognition may occur with the absence of emotional response. Cognitive information processing determines emotional response to the perception and judgment of consumption experience (Schiffman & Kanuk, 2010). As such, early researchers in this sense thought that emotion results from a sequence of mental activities such as perception and appraisal.

On the other hand, some social psychologists suggest that emotion occurs without any cognitive activity (Moreland & Zajonc, 1977; Zajonc, 1980). Zajonc (1980) in this

sense made an important argument about the relationship between feeling and thinking. He argued that affective judgments could be made without or before the perceptual and cognitive activities. That is, the most immediate reaction to the environmental stimuli is not cognitive, but affective. In this sense, most of the research portrayed the concept of attitude from an affective view of consumer behavior. In addition, Plummer and Holman (1981) argue not only that emotion occurs before any cognitive activity, but that consumer feelings (emotions) are more important than cognition in terms of the perception and judgment of products. They also argued that emotional states are associated with the structures for cognitive responses (memory structures). These structures are more easily and quickly recovered from a memory with an association with mood. In this view of affect, it suggests that advertising with emotional appeals will be more effective in terms of a cognitive process than advertising without emotional appeals, and also advertising which stimulates emotions previously associated with an experience will be more effective than advertising which does not stimulate emotions in terms of the perception and judgment of products (Plummer & Holman, 1981).

Many studies in the consumer behavior literature have attempted to understand the similarities and differences between emotion and affect in the issues of definition (Holbrook & O'Shaughnessy, 1984). Holbrook and O'Shaughnessy (1984) considered the affective response as 'consumption emotion' in that emotion is similar to or the same as affect. Stout and Lecken (1986) also defined the affect and emotion as "subjective feelings or felt experiences as verbally expressed by the individual." As such, the two terms have frequently been used interchangeably in the literature (Bogzzi, Gopinath, &

Nyer, 1999). Accordingly, many researchers on consumer behavior studies have attempted to include only one aspect of emotion in the design of the empirical measures, namely favorable predisposition or liking in order to measure affect (Westbrook & Oliver, 1991).

In line with the single affective component model, previous studies have failed to provide empirical evidence to support the relationship between attitudes and behavior (Corey, 1937; LaPiere, 1934; Wicker, 1969). Attitude researchers have long recognized that the definition of attitudes based on only the bipolar affective dimension is insufficient to fully capture a variety of relevant attitudinal properties since this conceptualization of emotion ignores the remainder of the emotional spectrum: love, hate, fear, anger, joy, and sorrow (Peterson, Hoyer, & Wilson, 1986). Accordingly, with the affective dimension of attitude construct, cognitive components of attitude such as beliefs and knowledge have received considerable attention in the past research.

Beliefs and Knowledge.

In the multi-component views of attitude structure, the concept of belief is highlighted with the basic assumption that attitudes originate from an individual's salient beliefs based on his or her cognition (Fishbein & Ajzen, 1975). Beliefs refer to the subjective associations between an attitude object and its attributes (Fishbein & Ajzen, 1975). As such, an individual's attitude toward an object is a function of beliefs linked his evaluations to its attributes. Beliefs are composed of prior experiences, knowledge, ideas, and other cognitive activities (Eagly & Chaiken, 1993).

In the associated network models proposed to understand memory system, an attitude object and its evaluation are presented as concepts or nodes which are linked. In the model, a single belief is interpreted as a linked node, and can be linked to others to present relations between beliefs. A linkage between beliefs is a form of an attitude stored in the long-term memory. Clusters of beliefs related to the attitude object (belief system) determine an individual's attitude when salient ones among the clustered beliefs are activated from memory in a given situation (Subramaniam & Silverman, 2000). In conceptualizing attitude in the associative networks, beliefs represent a base of attitude structure.

With the functions of beliefs in attitude formation, consumer knowledge and its attitudinal effects have been theoretically explored as in the consumer psychology and behavior literature (Muthukrishnan & Weitz, 1991). Alba and Hutchinson (1987) concluded that consumer knowledge as a relevant and significant consumer construct directly influences a decision making process. With products knowledge, consumers gather and organize information about the products, and ultimately make a purchase decision through a cognitive process.

Going beyond the impact of knowledge on information search and analysis, Rao and Sieben (1992) found the level of consumers knowledge has an influence on the quality of judgments and price acceptance, as well as the use of evaluation strategies, information processing, and the relative use of a systematic decision making process. They also found that consumers with high and low knowledge respond differently to a

variety of consumption settings. These findings and conclusions provides an insight into the role of consumer knowledge in attitude formation and attitude strength.

Since the 1980s, a substantial number of studies have focused on the effects of consumer knowledge on consumption behaviors (Bettman & Park, 1980; Brucks, 1985; Johnson & Russo, 1984; Rao & Monroe, 1988). For examples, Bettman and Park (1980) investigated the effect of prior knowledge and experience on decision making processes. Johnson and Russo (1984) also studied the impact of knowledge on new product information process (learning). Rao and Monroe (1988) focused on product information used for product evaluations, and Sujana (1985) examined effects on strategies of evaluation processes. These studies conclude that consumers with high knowledge differ from consumers with low knowledge, in terms of information processing, evaluation strategies, and decision-making. The differences in consumer behaviors between high and low knowledge consumers results from consumer differences in cognitive structures, capabilities of analysis, inference and memory.

Attitude Strength

Given the general assumption among attitude researchers that attitude is a strong predictor of future behaviors, previous studies have failed to provide empirical evidence to support the relationship between attitudes and behavior (Corey, 1937; LaPiere, 1934; Wicker, 1969). Attitude researchers have investigated the structural and functional bases of attitudes to explain the relationship between attitude and behavior. A substantial amount of research on the structure of attitudes has been conducted under a concept of attitude strength because attitude strength is thought to be one of the most important

concepts in determining whether attitudes are successful predictors of behavior (Petty, Wegener, & Fabrigar, 1997). These studies have examined the underlying properties of attitude which are associated with attitude strength.

In the social science literature, attitude researchers have attempted to define the broad concept of attitude strength, but until recently they fail to reach a consensus of its predominating conceptual definition. Krosnick and Petty (1995) considered attitude strength as certain attributes attitudes possess rather than a latent psychological construct. Nonetheless, an overall consensus among researchers is that durability and impactfulness are used to conceptualize attitude strength (Chaiken et al., 1995; Krosnick et al., 1993). Taking this approach, Krosnick and Petty (1995) refer to attitude strength as “the extent to which attitudes manifest the qualities of durability and impactfulness” (p3). As such, durability and impactfulness are considered as the underlying dimensions of attitude strength. In line with this conceptualization, the degree of durability depends on stability over time and resistance to change. That is, strong attitudes are persistent over time (stability) and are resistant to change (resistance). In addition, impactful attitudes are those that influence cognitive information processing and attitude-behavior consistency (Boninger et al., 1995; Krosnick & Petty, 1995; Petty, Haugtvedt & Smith, 1995). That is, strong attitudes lead a biased cognitive processing (impact on judgments) and predict future behavior (guiding behavior). In conceptualizing attitude strength in terms of durability and impactfulness, strong attitudes are stable, resistant, and influential on cognition and behavior.

Bollen and Lennox (1991) suggested that it has been difficult to operationalize attitude strength because attitude strength is viewed as a “phantom variable” rather than one single construct. In line with this opinion, attitude researchers indicated that four defining features of a strong attitude (e.g., persistence, resistance, impact on judgment, and guiding behaviors) are often highly correlated and completely interchangeable (Krosnick & Petty, 1995; Raden, 1985). For example, an attitude which is stable over time is likely to be resistant to change in the face of a counter argument. Consequently, researchers have attempted to identify and operationalize strength-related properties of attitudes which reflect attitude structure (Krosnick & Petty, 1995; Raden, 1985).

Raden (1985), based on Scott (1968)’s study, identified the number of properties of strong attitudes: accessibility, evaluative-cognitive consistency, certainty, direct behavioral experience, importance, latitudes of acceptance and rejection, and vested interest. Krosnick and Petty (1993) proposed ten dimensions that have received consideration in attitude literature: extremity, intensity, certainty, importance, interest in relevant information, knowledge, accessibility, direct experience, latitude of rejection and affective-cognitive consistency. Later, they categorized various attitude properties into four general strength-related dimensions: a) aspects of the attitude (e.g., valence and extremity attributes), b) aspects of the cognitive structure associated with the attitude and attitude object in memory (e.g., accessibility, knowledge, and direct experience), c) subject beliefs about the attitude and attitude object, and d) cognitive processes (Krosnick & Petty, 1995). The last strength-related dimension was cognitive process by which

attitudes were formed or changed (e.g., Elaboration likelihood Model of Persuasion and Heuristic Systematic Model).

Strength Related Consequences.

As mentioned earlier, attitude researchers have traditionally investigated the underlying properties of attitudes to explain the relationship between attitude and behavior. They have also examined the relationship between the underlying properties of attitude (e.g., accessibility, importance, knowledge, and certainty) and the strength-related features (e.g., stability, resistance, cognition, and guiding behavior) to explain how an individual form strong and stable attitudes which guide future behavior (Krosnick, 1989; Krosnick & Schuman, 1988; Fazio & Williams, 1986; Fazio & Zanna, 1978; Petty, Cacioppo, Shumann, 1983; Raden, 1985). Previous studies have indicated that strong attitudes are stable over time, resistant, impact of cognition and predictive of behavior (Fazio & Williams, 1986; Fazio & Zanna, 1978; Petty, Cacioppo, Shumann, 1983; Raden, 1985). As such, durability and impactfulness are considered as two critical features of a strong attitude (Fazio & Williams, 1986; Fazio & Zanna, 1978; Petty, Cacioppo, Shumann, 1983; Raden, 1985). Numerous studies have examined the effects of various attitude properties on the strength-related attributes.

Attitude Accessibility and Attitude Confidence.

The concept of attitude accessibility has originated from associative learning theory. The learning theory is based on the assumption that learning is a process in which a response becomes associated with a particular stimulus (see Pavlov's experiment for example). In the similar manner, Fazio's model of attitude (1995) posits that attitudes are

a learned association between an attitude object and its evaluation. Attitude accessibility is defined as ease or quickness with which attitude is activated or retrieved from memory automatically when the attitude object is encountered, that is the strength of the association. (Fazio, 1986; , 1995; Fazio et al., 1982). Accessibility has been hypothesized to determine the strength of this object-evaluation association. Consistent with this theoretical perspective, Fazio and his colleagues (1982) suggested that the greater the associative strength between an attitude object and a given evaluation, the more accessible attitude. A highly accessible attitude is more likely to be retrieved from memory easily and quickly upon observation of or inquiry about the attitude object.

Recent research on attitudes formation and attitude change has emphasized on attitude accessibility, which is vital to information processing linked to the creation of strong attitude. Petty and Wegener (1998) found that highly accessible attitudes are associated with selective processing of information with attention. That is, people with highly accessible attitude may be more likely to perceive the information as wrong or negative to protect their belief or self concepts when counter- message is encountered. This approach demonstrate that highly accessible attitudes are more difficult to change (Bassili, 1996; Bassili & Fletcher, 1991; Wu & Shaffer, 1987) and more stable (Hodges & Wilson, 1993) than less accessible attitudes.

Conceptualizing attitude as an object-evaluation association, recent research on the relationship between attitudes and behavior has shown evidence of higher attitude – behavior consistency with the accessibility of an attitude. Attitude accessibility has been implicated as an important determinant of the degree to which attitudes guide subsequent

behavior (Fazio, 1986; Fazio et al., 1982; Fazio & Williams, 1986; Miller & Peterson, 2004). Fazio (1986) refers to behavior as a function of an individual's perception about the attitude object once the object is encountered. In general, one's perception of the object is likely to be influenced by any previously-formed evaluation through experience or ideas or thoughts about the object. He also suggests that attitude accessibility is a particularly relevant and important variable involved in the attitude-to-behavior process. To test the theoretical hypothesis, Fazio and his colleagues examined the role of attitude accessibility in the attitude-behavior consistency (Fazio, Powell, & Williams, 1989). They conducted an experiment in which subjects were asked to respond to attitudinal inquiries related to given objects via a computer-based task. At the end of an experiment, subjects' behaviors were observed by giving them an opportunity to select five products from a set of 10 alternatives. Both products selected and the orders of the products selected were used as individual behavior measures. The findings of the study indicated that in order to guide behavior, the attitude must easily or rapidly be accessible in memory before it can exert any influence on behavior. In other words, if not strongly associated with the object in memory, it may decrease the possibility of attitude-behavior consistency. Accordingly, attitude accessibility is considered one of the most important moderators of attitude-behavior consistency.

Within the media effect domain, subsequent studies on the moderating effects of attitude accessibility support the hypothesis of Fazio (1986) experimentally and statistically. The experiment of Berger and Mitchell (1989) produced the evidence that attitude accessibility has an important influence on the formation of attitude and

subsequent behavior. The study aimed to examine repetition effects of advertising on attitude accessibility and confidence and the strength of the relationship between attitudes and behaviors. Specifically, the research measured brand choice behaviors utilizing a methodological approach similar to those used by Fazio et al. (1989). At the end of the experiment, subjects were asked to select seven candy bars from among the five alternatives after being shown an advertisement for each candy bar. The number of each brand selected was used as a behavioral measure. The results indicated that repetitive exposure to message in advertising has significant effects on non-evaluative dimensions of attitude such as accessibility and confidence. In addition, the results are consistent with the proposition of Fazio (1986) that attitude accessibility moderates the relationship between attitudes and behavior.

With emphasis on the importance of attitude accessibility on the formation of attitude and behavior, in the social psychology area there have been a need for investigating what might determine the accessibility of the attitude from memory. In many studies, the accessibility was assessed with a reaction time to measure the integration of relevant experience and thoughts from memory upon the individual's encounter with object (Fazio et al., 1982). The findings suggested that the more quickly respondents can express an attitude, the greater an associative strength between the attitude object and its evaluation. Accordingly, the strength of this object-evaluation association was implicated as an indicator of the accessibility of the attitude from memory (Miller & Peterson, 2004).

Despite the role of attitude accessibility in the attitude-behavior relationship, Berger (1992) suggested that attitude accessibility may be a critical moderator of attitude-behavior consistency only in spontaneous decision-making situations. Accessibility may be less important in behavioral situations that call for or allow more deliberative decision making. Under these circumstances, whether or not attitudes influence behaviors may be a function of other variables such as attitude confidence. For example, under highly significant circumstances, a decision maker may reconsider such an attitude, and perhaps gather or evaluate new and more information before making decision. On the other hand, a decision maker held with a high level of attitude confidence may discontinue to gather further information search and reevaluation and may rely only on this previously formed attitude.”

In the Fazio Accessibility Model, focusing on the role of attitude accessibility on attitude –behavior consistency, other nonevaluative dimensions of the attitude such as attitude confidence have not been addressed. Unlike Fazio’s approaches to the attitude – behavior relationship, many studies indicate the influence of attitude confidence as moderators on attitude-behavior relationship (Berger, 1992; Berger & Mitchell, 1989). Berger (1992) defines attitude confidence as an individual’s belief that her or his evaluation is correct in making a judgment about an alternative. As such, individual attitude toward an object tends to be more subjective because it often influences the individual’s perception of the object. The degree of confidence in its evaluation can vary with the amount and quality of information available on which the attitude is based (Berger, 1992; Koriat, Lichtenstein, & Fischhoff, 1980). Attitudes based on the large

amount of and the high quality of information such as product trials (direct product experience) is likely to be held with higher levels of confidence than attitudes based on less credible information such as advertising (indirect experience) (Berger, 1992; Fazio & Zanna, 1981). That is, considering that the direct product experience leads to increased knowledge and more favorable attitude, it is believed that attitudes generated from direct experiences are held with strong confidence (Fabrigar, Macdonald, & Wegener, 2005).

Furthermore, previous studies have demonstrated that repeated exposure to a persuasive message increases level of attitude confidence (Berger & Mitchell, 1989). These studies indicated that the repetition of a persuasive message encourage audiences to encode greater amounts of information and evaluate the implication and clarity of the information (Berger, 1992). Through this repetitive process, an individual can believe that her/her evaluation of the information is accurate, and then the attitude is held with higher level of confidence.

Repetition Effects

The repetition effects on communication effectiveness have been studied in the field of psychology and marketing within the context of attitude formation and change paradigms, such as “mere exposure” (Sawyer, 1981; Zajonc, 1968) or “learning” (Mitchell & Olson, 1977; Cacioppo & Petty, 1979). The leading explanation of repetition effects is based on Zajonc’s (1968) mere exposure theory. It generally has been assumed that mere repeated exposure to a stimulus object has a positive effect on attitudes toward it without extensive cognitive processes (Zajonc, 1968). The mere exposure effect refers

to the phenomenon that simply repeating exposure to objects leads to the increased preference for objects. He conducted three experiments in which subjects were repetitively exposed to a series of stimulus objects such as Turkish words, Chinese characters, and photographs from one to 25 times, and then asked to guess the meaning and express their attitudes toward the stimuli. The findings of the experiments indicated that when people are repetitively exposed to new stimuli, they generate positive thoughts about the stimuli. That is, increased exposure to stimuli result in favorable attitudes toward those stimuli. More subsequent studies on the mere exposure effect support the hypothesis of Zajonc experimentally and statistically by demonstrating the impact of mere exposure to stimulus on its evaluation without cognitive information process. Two experiments of Saegart, Swamp and Zajon (1973) provided evidence that repeated exposure increases positive evaluation under either pleasant or unpleasant situations.

In the field of advertising, mere exposure theory has been actively explored on attitudinal effects of repeated message exposure (Cacioppo & Petty, 1979; Calder & Sternthal, 1980). Within this paradigm, many researchers have attempted to replicate the positive effects of advertising on promoted brands or products with repeated exposure to message. However, previous research on advertising repetition has shown a curvilinear relationship rather than the positive linear relationship between message repetition and its attitudinal effectiveness (Anand & Sternthal, 1990; Vakratsas & Ambler, 1999). According to proponents of this curvilinear relationship, increased exposure to new message results in positive thoughts about the message during initial presentation. With further repetition, people generated negative thoughts about the stimuli because they get

tired of them. In an attempt to explain the conflicting findings, Miller (1976) pointed out a saturation point at which people get tired with further exposure resulting in negative thoughts. Similarly, Berlyne (1970) demonstrated an inverted U-shaped relationship between message repetition and attitudes in experiments to examine a relationship between familiarity and liking. According to his explanation about the impact of “tedium”, “the underlying mechanism of the inverted U-shaped relationship involves two separate and opposing psychological processes such as habituation and tedium resulting from repeated exposure to the same message” (Beryne, 1970). That is, increased exposure to new stimuli during initial presentation generate positive thoughts and evaluation about the stimuli in the process of habituation, and at some point, further repetition results in negative reactions to them due to “tedium” (Cacioppo & Petty, 1979; Calder & Sternthal, 1980).

Within this paradigm, however, researchers have been failed to explain the attitudinal effects of repetitive exposure to advertising on awareness and behavioral intention measures (Aaker & Myers, 1982; Sawyer, 1971, 1974). Miller (1976) for example found that repeated exposure to persuasive communications enhanced its behavioral responses although at some point further exposures resulting in tedium generate negative thoughts and evaluation. In the study, the reason for the discrepancy between attitude and the corresponding behaviors was unclear. One likely explanation for the finding may have to do with such a structure of attitudes as the underlying dimensions of attitude: evaluative and non-evaluative dimensions.

Past research has discussed advertising repetition effects within two non-evaluative dimensions of attitude to explain the relationship between attitudes and the corresponding behaviors. Fazio (1986) for example suggested that advertising repetition under certain condition influences non-evaluative dimensions of attitudes such as attitude accessibility. According to his explanation, increased exposure to advertising leads to increased cognitive elaboration and the strengthened association between a message representation in memory and its evaluation. That is, under the same or similar situations, attitudes toward the promoted product in the advertising are more easily and rapidly activated from memory. As a result, attitudes formed by repeated exposure are predictive of subsequent behavior.

In addition, previous studies in decision making have found that repeated exposure has also influences on attitude confidence through cognitive processes. According to previous findings, people think that their judgment is accurate as the amount of information and opportunity to make attitudinal decision increase. Oskamp (1965) for example provided evidence that repeated exposure to more information from advertisement leads to increased confidence in judgment. Similarly Einhorn and Hogarth (1978) found that self-confidence in judgment increases because repeated exposure allows individuals to make more cognitive elaboration. As such, previous studies have shown that attitudes formed from repeated exposure are more predictive of subsequent behavioral intentions (see Petty, Cacioppo, & Schumann 1983; Schumann, Petty, & Cacioppo 1986). Therefore, the effects of repeated video gaming on attitude accessibility and attitude confidence are expected in video gaming contexts. Because this approach

extends mere exposure theory to sport video games, it seemed desirable to examine whether repeated sport brand exposure could affect not only the non-evaluative dimension of attitudes but also the relationship between attitude and behavior.

CHAPTER III: METHODOLOGY

The following chapter provides an overview of the steps that were taken in order to test the hypotheses proposed in Chapter I. The goals of the present research were 1) to examine the effects of repetitive exposure to a specific sport on attitude change, attitude accessibility and attitude confidence toward the sport which a video game emulated; (2) to investigate the moderating effects of attitude accessibility and attitude confidence on the strength of the attitude-behavior relationship. The proposed hypotheses were investigated on the basis of an experimental study in which subjects were directed either to play a NASCAR racing video game or watch a real-life NASCAR event, and then asked to indicate their reactions to a real-life NASCAR Brand (the sport itself). Each experimental condition represents the level of exposure to the brand. However, it was not known how many exposures were required to make brand attitudes formed on the basis of virtual experience similar to those formed on the basis of direct experience in attitude strength- related dimensions: attitude accessibility and confidence. Consequently, prior to conducting the main study, a pretest was conducted in an attempt to select the appropriate number of exposures for the purpose of this study. To determine the level of exposure, a direct experience condition as a reference group was included in experiment.

Pilot Study

The pretest was designed to identify how many videogame exposures are required to make virtual experience attitudes as accessible or held with as much confidence as direct experience attitudes. In an experimental context, a NASCAR themed video game and a prerecorded televised NASCAR race were used as stimuli for a virtual experience

and a direct experience respectively. The pretest was conducted with 44 undergraduate students enrolled at a large Midwestern university in the United States. Using a convenience sampling technique, subjects were recruited through classroom announcements that asked for volunteers.

The pretest was conducted to examine the strength of attitude with a small number of subjects in each of four test conditions: direct product experiences (n=12), one (n=10), three (n=12), and five exposures (n=10). Even though the number of subjects in the pre-test is not enough to make any analysis, it was expected that the preliminary study provide some insight into the level of exposure for conducting a main study.

Once consent was provided each subject was randomly assigned to one of four experimental groups: a direct experience condition and one, three, or five exposures. Prior to participating in the experiment, subjects were asked to take a short survey including questions about demographic information and their experience with the NASCAR brand. In order to provide sufficient motivation for subjects to process brand information, they were instructed that the purpose of the study is to collect their evaluation of a certain sport brand.

In the exposure treatment groups, subjects were asked to play a 15 minute segment of a SVG which included qualifying (5 minutes) and the race (10 minutes) after a trial session (5 minutes). Similarly, subjects in the three and five exposure conditions were asked to play two or four additional times respectively. After playing the video games, they were asked to complete the same questionnaire as in the single exposure condition. After completing the questionnaires, subjects participated in the response time

task. Similarly, subjects in the direct experience group were required to watch a 15 minute segment of an actual NASCAR race. Following the subject's exposure to either a video game or a sporting event they were asked to fill out a survey about attitude confidence, and then to measure attitude accessibility via a computer. The subject's latency scores for the NASCAR brand were adjusted to control for error variance due to individual differences in general responding. Standardized latency scores were used to represent attitude accessibility.

The information from the completed surveys was entered into a computer database and analyzed using SPSS 18. To describe the demographic information, frequencies and descriptive statistics were used. One-way between-groups analysis of covariance (ANCOVA) tests were then performed to test the statistical difference of attitude accessibility and confidence scores across the four conditions, with sport brand familiarity (NASCAR) defined as a covariate. For analysis, summated scores of brand familiarity were computed.

For the analysis, all of the scales were adopted from previous research with some modified to fit this study. Attitude confidence was measured using a seven-point semantic differential scale with three items used by Berger and Mitchell (1998). The scale had high internal consistency, so their mean was used to represent attitude confidence. Coefficient alphas on the two items were .95. In addition, the reliability for the brand familiarity construct is also very high (coefficient alpha = .87). Analysis of these data suggested that the overall reliability of the measures was acceptable.

All respondents were between 18 and 25 years of age. The majority of the respondents (56.8%) were White/Caucasian, with 20.5% of the respondents being of Asian/Pacific Islander decent, and 6.8% were Black/African American. The gender distribution of respondents was 45.5% female and 54.5% male, with 97.7% of the respondents indicating that they were single.

A one-way between-group ANCOVA was performed to compare the effectiveness of four different exposure conditions. The independent variable was four exposure conditions (single, 3, 5 exposures, and direct experience), and the dependent variable was either brand accessibility or confidence scores. Subjects' NASCAR brand familiarity scores were used as the covariate in this analysis. Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, linearity, homogeneity of variances, homogeneity of regression slopes, and reliable measurement of the covariate. The results revealed there were no significant main effects of the brand familiarity [$F(1,39)=1.724, p=.197$ and $F(1,39) = 3.532, p=.068$ respectively] on attitude accessibility and attitude confidence scores. After adjusting for brand familiarity scores, there was a statistically significant difference at the $p<.05$ level in attitude accessibility and attitude confidence scores for four treatment condition groups [$F(3, 39)=5.68, p=.001, \text{partial eta squared}=.304$ and $F(3,39)=6.22, p=.001, \text{partial eta squared}=.324$ respectively]. The adjusted means on attitude accessibility and attitude confidence scores across conditions are presented in Table 3-1 and 3-2 respectively.

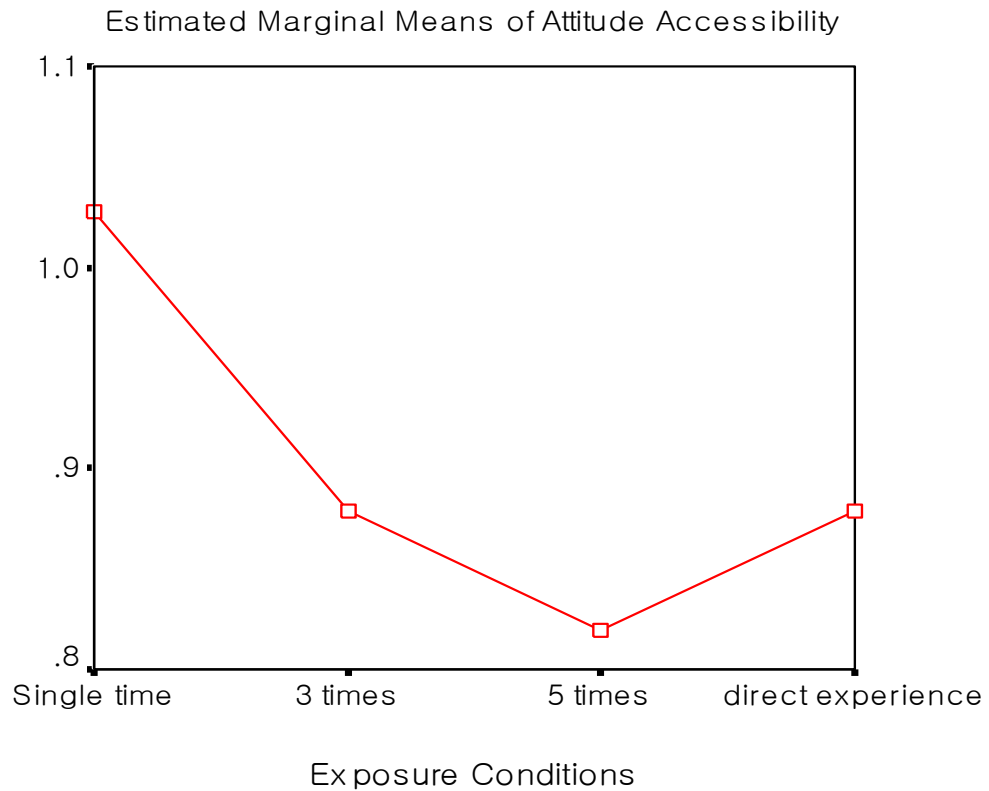
To confirm the significant difference between attitude accessibility scores across conditions, post-hoc comparisons using the Bonferroni test was conducted. The results

indicated that the mean score for a direct experience group ($M=0.879$, $SD=.035$) was significantly different from a single exposure group ($M=1.027$, $SD=.036$). The direct experience group ($M=0.879$, $SD=.035$) did not differ significantly from either the three ($M=0.879$, $SD=.039$) or five exposure ($M=0.819$, $SD=.040$) group. A plot of estimated marginal means of attitude accessibility scores across conditions are given in Figure 3-1.

Table 3-1 Estimated marginal means of attitude accessibility.

Exposure condition	Mean	Std. Error	N
Single exposure	1.027	.036	10
Three exposures	.879	.039	12
Five exposures	.819	.040	10
Direct experience	.879	.035	12

Figure 3-1 Attitude Accessibility



Note: Recall lower response latencies indicate higher accessibility

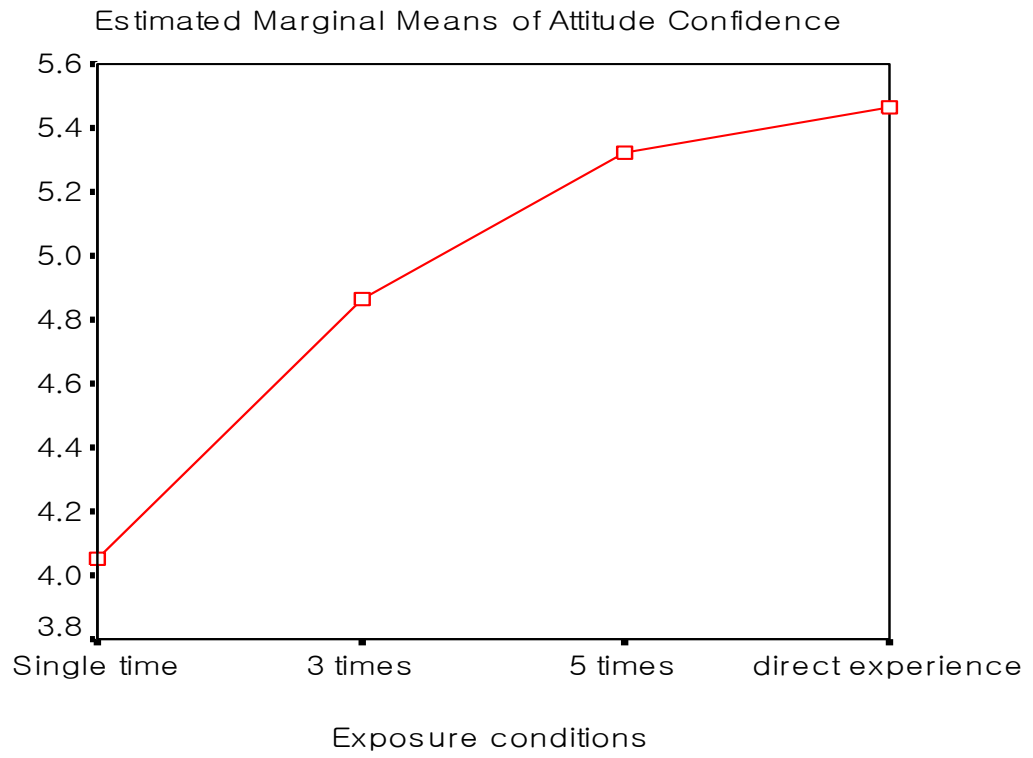
Similarly, post-hoc comparisons using the Bonferroni test was performed to confirm the mean difference between attitude confidence scores across conditions. The results indicated that the direct experience group ($M=5.467$, $SD=.348$) did not differ significantly from either the three ($M=4.883$, $SD=.381$) or five ($M=5.231$, $SD=.391$) exposure group, while there was a statistically difference in mean scores of attitude confidence between the direct experience and single exposure ($M=3.480$, $SD=.352$) group. The findings of the pretest suggest that three repetitions of the video game play could achieve levels of accessibility and confidence close to those of direct experiences.

A plot of estimated marginal means of attitude confidence scores across conditions are given in Figure 3-2.

Table 3-2 Estimated marginal means of attitude Confidence.

Exposure condition	Mean	Std. Error	N
Single exposure	3.480	.352	10
Three exposures	4.883	.381	12
Five exposures	5.231	.391	10
Direct experience	5.467	.348	12

Figure 3-2 Attitude Confidence



Main Study

Research Design

The hypotheses proposed in Chapter I were tested using an experimental design, with a NASCAR racing video game and a real-life NASCAR event as stimuli. The experiment was conducted in a laboratory setting in which participants were randomly assigned to either one of experimental groups or a reference group. In the experimental groups, participants were exposed to the NASCAR embedded in a video game with varying levels of exposures as a treatment. In the reference group, participants were exposed to a prerecorded NASCAR event on television. It was expected that having this reference group will allow for comparisons with experimental conditions to be made and to understand if the exposure to a sport brand in a virtual environment has some effect on attitude strength related dimensions, and whether attitudes based on virtual experiences are similar to those based on direct experiences in terms of attitude accessibility and confidence. For the purpose of the study, a one-way between-subjects design was used. The four cells were made up of 3 exposure level conditions (one, three, and seven exposures) and a direct experience condition.

Participants

College students as the target population for this study were selected. There are two reasons for focusing on college students rather than the general public as the population of interest in the proposed study: such users are a significant target market in both the video game industry and the sport industry.

Recent research conducted by the Pew Internet and American Life Project (2008) showed that 81 percent of respondent 18-29 years old plays video, computer, or online games at least once a week. Some 65 percent of college students reported being regular or occasional game players. Accordingly, marketers are anxious to use games to target younger adult consumers, including college students (Emling, 2002). Furthermore, the majority of college students do indeed fall within the highly desirable male 18-34 demographic (Levine, 2005). This demographic has become a segment difficult to reach by advertisers in recent years, and yet represents a significant target market with disposable income. In fact, Levine (2005) indicated that this group of consumers is among the top spenders for items such as automobiles, stereo equipment, and sneakers, and they spend an average of \$13.5 billion on internet purchases alone. In the sport industry, college students are also considered to be significant consumers and users of sport (Ross, 2006).

Sampling method

As mentioned above, college students are identified as the target population for this experiment because they are significant consumers in both the video game industry and the sport industry. However, given no representative list of the population to serve as a sample frame, it is impossible to draw a random sample from the population. Therefore, it is necessary to identify an appropriate accessible population that would be classified as a subset of this target population and then sample from this subset. The accessible population that has been identified is individuals who have enrolled in colleges or universities during the conducting of this study. Accordingly, using convenience

sampling method, the sample for the study was drawn from undergraduate and graduate students enrolled in the 2008 fall semester at a Mid-western university. The classes were selected non-randomly based on availability and accessibility to the researcher.

Determining the sample size is an important issue in experimental research due to the likelihood that experimental results differ from chance expectations (Thalheimer & Cook, 2002). To determine the appropriate sample size in this study, the G*Power 3.0 program developed by Faul and his colleagues in 2007 was used. According to a priori power analysis, when choosing an alpha level at .05 and a medium effect size ($f=.25$), a total sample size of approximately 180 participants, or 45 persons per group, are needed to reach a power of .80 (Faul, Erdfelder, Lang, & Buchner, 2007).

Procedure

In this study, the researcher contacted instructors and requested permission to conduct the research project during class time in order to access the respondents. Upon gaining approval, subjects were initially solicited by classroom announcements and contacted via email to arrange a time for them to participate in the study. In order to encourage participation in this study, two incentives were provided: 1) a chance to win two tickets to a 2009 sporting event; and 2) a chance to win a \$10, \$20, or \$50 gift card.

To determine a winner of the event tickets, subjects were asked to select a number between 0 and 100. The numbers they selected were summed, and then divided by the number of subjects. As a result, the remainder of the division was used as the number for the winner. An identification number of each subject which was assigned at the beginning of the experiment was used to select a winner. Each subject was also given a chance to

win one of the gift cards through a drawing after completing the experiment. The lucky numbers for the winners were a 52 for two tickets, a 53 for \$50, a 54 for \$20, and a 55 for \$10. At the end of 2008, the selected winner was notified via email.

On arrival to the lab, subjects were greeted and asked to read a consent form before beginning the study. Once consent was provided, each subject was randomly assigned to one of the four experimental conditions. Subjects participated in an introduction session in order that the subjects are motivated to evaluate the sport brand information. At this point, subjects were asked to complete a short questionnaire designed to collect background information on experience with the NASCAR brand. In the videogame group, after completing the short survey, subjects were asked to play a 20 minute segment of a SVG which included practice time (5 minutes), qualifying time (5 minutes), and the race (10 minutes). Prior to playing the video game, the subjects were informed how to play the game and given a chart describing the functions of each button on the video game controller. Respondents were instructed to select specific racing options, such as an athlete, a car, sponsors and a speed track in the game for 5 minutes to ensure consistency. Each game was played on a Sony PlayStation 2 gaming system and was viewed on a 27-inch flat screen TV. Similarly, subjects in the three and seven exposure conditions were asked to play two or six additional times respectively for qualifying and the race. Subjects in the direct experience group were asked to watch a prerecorded NASCAR event for 20 minutes. Following the subject's exposure to either the video game or the televised event they were asked to complete a survey designed to measure brand attitude and attitude confidence. It is important to note that all subjects of

the video game experimental groups played with the same car and track. Similarly, the television experimental group watched an actual race from the same track represented in the video game experimental setting.

After completing the post-test questionnaire, subjects were asked to sit in front of a personal computer for the response time portion of the study. In this stage, subjects were advised of the speed-accuracy trade-offs inherent in the task and told to answer as accurately as they could. Next, the subjects participated in a practice session to familiarize them with the keyboard and the task. After the practice session, the actual response time were measured. Last, at the end of the experiment, subjects were asked to rank each sport brand in order of preference from among eight sport brands under each of 10 brand choice situations. The rank of each sport brand was used as a behavior measure. The whole process took an average of 50-60 minutes.

Stimuli

For the purpose of the study, the 2006 NASCAR Game for virtual sport experience was selected as a test material for two reasons. First, the racing game emulating NASCAR is very realistic and interactive. That is, it includes three-dimensional graphics and sound effects of automobiles driving and skidding. The game is filled with a number of sport brands as well as advertisements on the billboards in the racetrack. Most of the sport brands embedded within the game are real racing teams, athletes, racing tracks, and the sport itself. In addition, compared to other popular SVGs such as the NFL Madden series, the game is relatively easy and simple to play even for beginners. The characteristics of the racing game are advantageous because researchers

are able to recruit a broader range of subjects without worrying about gaming skills or confusion caused by complexity of the game. Thus, it is expected that all subjects will be easily aware of how to play.

In contrast, a prerecorded televised 2006 NASCAR sporting event was selected as the stimulus for direct experience. Watching a sporting event on television is one of the most popular sport consumptive behaviors (Mullin, Hardy, & Sutton, 2000). For potential fans as well as sport fans, this is more accessible than attending a sporting event. The televised sporting event enables sport consumers to interact with the NASCAR series and feel their initial emotional experiences with the NASCAR brand. Thus, it is expected that the televised sporting event represents direct experience.

Instruments

Most of the scales were adopted from previous research with some modified to fit the context of this study. As recommended by Anderson and Gerbing (1984) and Bentler and Chou (1987), all constructs of this study, except for attitude accessibility, were measured by at least three observable indicators (items). These items are written in the form of statements, most using a seven-point Likert type or semantic differential rating system. The following section describes the independent, dependent and moderating variables that will be used in this study, and the methods of measurement for each construct.

Independent Variables.

Repetition. The findings of the pretest showed the three exposure group did not differ significantly from the five exposure group in mean scores of attitude confidence

and attitude accessibility. In the current study, the seven exposure condition as one of the repetition conditions was arbitrarily created rather than five exposure condition used in the pretest, since there is no research on the repetition effects of video games, in order to determine whether there is a significant linear trend in the relationship between repetition and the proposed dependent variables. It is anticipated that the levels of repetition used in the study will enable a greater variance in repetition effects due to greater exposure. This is consistent with Machleit and Wilson's (1988) suggestion that researchers should include enough exposures to a test stimulus to investigate repetition effects. It should be noted that it is not uncommon for video game users to be subjected to seven (or even more) repetitions of the same video game (Griffith & Chen, 2004). Accordingly, subjects were exposed to the NASCAR video game either one, three, or seven times.

Dependent Variables.

Attitude toward a specific sport (NASCAR). Brand attitude was measured using an established four-item, a seven-point semantic differential scale anchored by very unfavorable/very favorable, very good/ very bad, very unsatisfactory/very satisfactory, and like extremely/dislike extremely. Previous studies have shown that the scale has high internal consistency (Berger & Mitchell, 1989). Individual item scores were summed to represent brand attitude.

Attitude Confidence The construct of attitude confidence was first measured by Norman (1975) to investigate the strength of the attitude-behavior relationship. Since then, a number of studies have used a scale developed by Norman (1975) to measure the construct (Fazio & Zanna, 1978a; 1978b; Berger & Mitchell, 1989; Berger, 1992). These

studies indicated that the scale with three items has high internal consistency. For example, Berger and Michell (1989) show highly coefficient alpha (.93) for three items. Accordingly, attitude confidence was measured using the three items, a seven point semantic differential scale ranging from not confident (1) to confident (7); uncertain (1) to certain (7); not sure (1) to pretty sure (7). Participants were asked to rate their certainty that their judgments about NASCAR was accurate. In this study, individual item scores were summed to create an individual attitude confidence score.

Attitude Accessibility Fazio (1986) operationalized attitude accessibility as the latency of response to an attitudinal inquiry. A large number of studies have measured accessibility through response latencies (Bassili, 1996; Fazio, Powell, & Williams, 1989; Fazio & Williams, 1986). These studies used a computer program developed by the researcher using the C++ program to measure response latencies (i.g., reaction time). The researcher developed three different versions of the program in which the key brand (NASCAR) was presented on either a second, fifth, or eighth page to eliminate possible sequence effects (Loda & Coleman, 2005). Attitude accessibility was measured using the same procedures as Fazio et al. (1982). Participants were told that ten brand names (e.g., NFL, MLB, FIFA) from various sport categories (e.g., football, baseball, soccer,) will be shown on a computer screen and they need to press either “z” key for like or “/” key for dislike on the keyboard to indicate their feeling about each brand (Jewell & Unnava, 2003). In the latency test, participants were instructed to respond as quickly and accurately as possible (Fazio, 1990).

In addition, to avoid confusion and familiarize participants with the test procedure, participants had a trial session with different brand names from the actual test. After the trial session, participants were asked to take the actual test. Once completing the actual latency test, the response (like or dislike) and the reaction time data were entered into a computer database.

Previous research on measures of attitude accessibility has shown that the response times were highly skewed and there were a few abnormally long response times even though the results from the computer-based test have acceptable levels of internal consistency (Berger & Mitchell, 1989; Fazio et al., 1982). Accordingly, cognitive psychologists typically consider such abnormally long responses as errors resulting from individual inattention or distraction. The subject's latency scores for the NASCAR brand were adjusted to control for error variance due to individual differences in general responding. To standardize the latencies across participants, each participant's latency score to the NASCAR brand was divided by the mean of latency scores for the rest of 10 brands (test latency/mean filler latency) (Fazio, 1990; Jewell & Unnava, 2003). The ratio of actual latency score to mean latency score was used with negative or positive direction. For example, if respondent responded to a brand with a 0.6 ms of the reaction time (the mean of his/her latency scores: 0.8) and negative evaluation, his/her latency score is $-0.75 [= (0.6/0.8) * (-1)]$. The standardized latency scores represent attitude accessibility.

Behavior The behavioral test was conducted using instructions similar to those used in previous studies (Berger & Mitchell, 1989; Fazio, Powell, & Williams, 1989). For

the purpose of the study, the researcher created 10 brand choice situations in which subjects would be asked to rank each of eight different sports in order of preference: NBA, NASCAR, MLB, NHL, MLS, NFL, FIFA, and NCAA. For example, it was assumed in a brand choice context that subjects were given a chance to choose a ticket for a sporting event. Subjects were instructed to rank each ticket for eight different sporting events in order of preference. The order of the sports selected for each sporting event served as individual's behavior measures. The scoring of behavior as a function of order of selection assumes that subjects chose first their most preferred sporting event or licensed product, then their second most preferred event or product, and so on. Finally, behaviors in brand choice contexts were coded on a 0-to-7 scale: 0 (least preferred) and 7 (most preferred). The behavior measure for the NASCAR brand was only used as each individual's brand behavior score.

The brand choice situations were designed to reflect brand choice contexts in sport product categories (see Table 3-3). Various sport products used in the study consisted of tickets to a 2009 sporting event and licensed sport products featuring each of eight different sports. The sport products were selected based on the three most popular sport consumption behaviors: attendance (tickets to a sporting event), media consumption (a subscription for magazine, a highlight DVD, a televised sporting event, and online sport news), and licensed merchandise purchasing (a jersey, a desk clock, a vertical flag/banner, a key chain, and a coffee mug).

Table 3-3 Brand Choice Situations

Consumptive behaviors	Brand Choice Situations	Products
Attendance	Situation 1	Two tickets to a 2009 sporting event
Media Consumption	Situation 2	Subscription for magazine
	Situation 3	Highlight DVD
	Situation 4	Television sporting event
	Situation 5	Online sport news
Merchandise Purchasing	Situation 6	Jersey
	Situation 7	Desk clock
	Situation 8	Vertical flag/banner
	Situation 9	Key chain
	Situation 10	Coffee Mug

The methodological approach to the behavior measurement used in the study may be shown as a way to measure brand preference rather than actual behaviors. In marketing and advertising literature, consumer behaviors typically have been assessed with observation of their reaction to a particular brand and alternatives in brand choice situations. Brand preference is referred as the degree to which consumers prefer a particular brand over competitive offerings. According to Amir and Levav (2008), consumers tend to resolve trade-offs between conflicting attributes in a choice set during a decision process. Consumers with brand loyalty tend to select a particular brand in presence of competing brands, but they tend to accept substitutes if the brand is unavailable (Amir & Levav, 2008). With the tendency of purchasing behavior among consumers, previous research on consumers behaviors have interpreted brand preference as an indicator of purchase behavior (Berger & Mitchell, 1989; Fazio et al., 1989).

Accordingly, with a methodology similar to those used in previous studies, consumptive behaviors in this study were measured.

Control Variables.

There are two potential covariates: sport fan identification and brand familiarity. These variables were included as covariates in the analysis because they are significantly related to a specific dependent variable. This was done to control for possible influence as extraneous sources of variance and to explore the nature of their potential role in the effectiveness of SVGs (Holbrook et al. 1984).

Brand Familiarity A seven-point semantic differential scale with three items was used to measure brand familiarity. Experience and knowledge are identified as the two major components of brand familiarity relevant to consumption experiences such as product use and trials (Havlena & Holbrook, 1986; Kempf & Smith, 1998; Mano & Olicka, (1993). The items include: “Unfamiliar-Familiar,” “Inexperienced-Experienced,” and “No information-A great deal of information” (Kempf & Smith, 1998; Mano & Oliver, 1993). The scale used in a study by Laroche, Kim, and Zhou (1996) was proven to be valid and reliable for accessing familiarity with several different brands. Individual item scores were summed to create an individual familiarity score.

Sport Fan Identification A seven point Likert-type scale with four items was used to measure sport fan identification. The four items examine sport fan identification as 1) the level of favorability for the NASCAR brand, 2) thinking of oneself as a “real” fan of NASCAR, 3) the importance one puts on being fan of NASCAR, and 4) the importance of expressing to others that they are a fan of the team (Trail & James, 2001).

The identification scale was proven to be valid and reliable in previous work (Funk, Trail, & Anderson, 2002; Trail et al., 2003). The identification construct was used as a possible covariate that influences the dependent variables as brand attitude, attitude accessibility, and attitude confidence. Individual item scores were summed to create an individual fan identification score. Table 3.4 summarizes the measurements and scales for variables used in the study.

Table 3-4 Scale Matrix for Variables

Variable/Construct	Scale	Ranges	Measurement
Brand Attitude	Interval	From 1 to 7	Semantic differential Scale
Attitude Accessibility	Interval	From $-\infty$ to ∞	Computer based test
Attitude Confidence	Interval	From 1 to 7	Semantic differential Scale
Sport Identification	Interval	From 1 to 7	Likert-Type Scale
Brand Familiarity	Interval	From 1 to 7	Semantic differential Scale
Consumption Behavior	Ordinal (Ranks)	From 0 to 7	Observation

Data Analysis

The information from the completed surveys was entered into a computer database and analyzed using SPSS 16.0. Reliability assessment for each scale was conducted using Cronbach's alpha correlation coefficients and the average variance extracted (AVE). To test the internal consistency of all items within a measure,

Cronbach's alpha coefficient was utilized. An alpha level of .70 recommended by Nunnally and Bernstrin (1994) was used as the minimum acceptable standard for demonstrating internal consistency. In addition to a test of internal consistency, the amount of variance explained by the identified construct relative to the amount of variance attributed to measurement error (AVE) was examined. Average variance extracted by a construct should be greater than the unique variance, that is, the AVE values should exceed .50 (Fornell & Larcker, 1981).

The specific analyses were guided by the requirements of each particular hypothesis (see Table 3.5 for the test of each hypothesis).

Table 3-5 Tests for Hypotheses

Hypothesis	IV	DV	CV	Test
H1	Exposure Conditions	Post-Attitude	Pre-formed Attitude	ANCOVA
H2	Exposure Conditions	Attitude Accessibility	Sport Identification Brand Familiarity	ANCOVA
H3	Exposure Conditions	Attitude Confidence	Sport Identification Brand Familiarity	ANCOVA
H4a	Levels of Exposure	Correlation between Attitude and Behavior		Correlation Pairwise Comparison
H4b	Levels of Exposure	Correlation between Attitude and Behavior		Correlation Pairwise Comparison

Note: IV=Independent variable; DV=Dependent variable; CV=Covariates.

To test hypothesis H1 through H3, Analysis of Covariance (ANCOVA) was utilized to test mean differences of a dependent variable across the experimental groups while statistically controlling for covariates that may influence scores on the dependent variables. That is, by removing the variation of the dependent variable which is attributed to the covariates, ANCOVA tests whether there are differences in the corrected or adjusted group means. Therefore, it allows the researcher to more accurately assess the impact of experimental manipulation (e.g., levels of exposure to a sport brand) and further increase the power of the F-test. Although the initial output of the ANCOVA analysis provides an indication if there are differences in the group means across the reference and the experimental groups, this is still not enough to test the proposed hypotheses. Thus further post hoc analysis was conducted to determine any specific contrasts between the groups.

For making comparisons among individual means, specifically, Bonferroni post hoc analysis was conducted to investigate the proposed hypotheses H1-H3. Bonferroni post test is being used for making post hoc comparisons that ensure a family-wise type I error rate no greater than alpha, the level of significance, after all comparisons are made.

Prior to utilizing ANCOVA for testing the proposed hypotheses (H1 through H3), the researcher examined the relationship between the identified covariates in order to select appropriate covariates. Based on the previous findings of sport fan studies, it was expected that brand familiarity and sport fan identification are correlated with both attitude accessibility and confidence as dependent variables. At the same time, it is assumed that the proposed covariates are correlated with each other. For example, highly

identified fans in a specific sport are more knowledgeable and familiar with the sport than casual fans are (Smith, Patterson, Williams, & Hoggs, 1981). As such, they have enough experience and information to make a judgment about whether or not to make a selection. Similarly, Kempf and Smith (1998) identified experience and knowledge as major components of brand familiarity. Thus, it is expected that the proposed covariates are highly correlated with each other.

According to previous studies (Stevens, 1996; Tabachnick & Fidell, 2000), a researcher should use a group of covariates that correlate substantially with the dependent variable but not with one another in using one or more covariates at the same time. To choose appropriate covariates, some preliminary correlation analyses were performed to explore the strength of the relationship among the proposed covariates (sport fan identification and brand familiarity). Because the correlation ($r=.53$) between the covariates was not strong, they were not removed in the analysis based on the strength of the relationship with the dependent variable.

Last, hypothesis H4, that enhanced attitude confidence and accessibility in virtual experience will moderate the relationship between attitudes and behaviors, was tested. A moderator effect of repetitive exposure to a brand implies that the variable (e.g., attitude accessibility, confidence) enhanced in the experimental conditions modifies the form of the relationship between the predictor variable (e.g., attitudes) and the criterion variable (e.g., behaviors).

For each brand choice context, the Spearman rank order correlation between attitudes and behaviors was then calculated within the experimental conditions. The

Spearman rank order correlation has been used to explore the relationship between two ranked variables. Unlike the rank ordered behavior scores, however, attitude scores are based on an interval scale rather than an ordinal scale. Thus, it is necessary that ranks be substituted for raw attitude scores (Howell, 2002). The attitude scores were converted to their corresponding ranks by ranking sets of attitude measurement data. The Spearman's correlation coefficient was then calculated to explore the strength of relationship between attitude and behavior within the four exposure segments. After the correlation coefficient for each product was transformed using the Fisher r-to-Z transformation, correlation pairwise comparison was then utilized to determine if there are significant differences (e.g., correlation coefficients) in the attitude-behavior relationship across the level of exposure.

CHAPTER IV: RESULTS

The study compared three exposure conditions designed to increase the level of brand exposure in a virtual sport environment with a direct experience condition. The study also examined attitude change and the strength of the attitudes resulting from repetitive exposure to the sport brand while playing a sport video game. The relationship between attitudes and behavior in a direct experience group was compared to that in virtual experience groups. This chapter reports the results of the study and is divided into two main sections: demographic profile and results of the hypothesis tests. In the first section, the characteristics of the sample are described using descriptive statistics. The second section provides the results of the hypothesis tests regarding attitudes and behaviors in experiment and reference groups.

Demographic Profile of Participants

A total of 197 undergraduate and graduate students at a large Midwestern university in the United States participated in the study. The research sample consisted of students studying in different fields (e.g., advertising, business, kinesiology, science, and law). All subjects were between 18 and 39 years of age ($M=25.71$; $SD=6.44$). The majority of the respondents (54.3%) were White/Caucasian, with 38.1% of the respondents being of Asian/Pacific Islander decent, and 2.5% were Black/African American. The gender distribution of respondents was 44.2% female and 55.8% male, with 75.6% of the respondents indicating that they were single. One hundred and sixty five subjects (83.8%) had total household incomes between \$75,000 and over \$120,000. The demographic profile of subjects is presented in Table 4-1.

Table 4-1 Demographics Characteristics of Experimental Groups

	Total(%)	1Time Exposure	3 Time Exposure	7 Time Exposure	Direct Experience
N	197(100)	50(25.4)	50(25.4)	51(25.9)	46(23.4)
Sex					
Female	87(44.2)	23(46.0)	23(46.0)	21(41.2)	20(43.5)
Male	110(55.8)	27(54.0)	27(54.0)	30(58.8)	26(56.5)
Age					
< 20	54(27.4)	13(26.0)	17(34.0)	11(21.6)	13(28.3)
20-24	50(25.4)	10(20.0)	10(20.0)	16(31.4)	14(30.4)
25-29	28(14.2)	9(18.0)	5(10.0)	8(15.7)	6(13.0)
30 ≤	65(33.0)	18(36.0)	18(36.0)	16(31.4)	13(28.3)
Marital Status					
Single	149(75.6)	40(80.0)	38(76.0)	38(74.5)	33(71.7)
Married	48(24.4)	10(20.0)	12(24.0)	13(25.5)	13(28.3)
Ethnicity					
Black/African American	5(2.5)	2(4.0)	1(2.0)	0(0.0)	2(4.3)
Native Hispanic	3(0.0)	0(0.0)	3(6.0)	0(0.0)	0(0.0)
White/Caucasian	7(3.6)	3(6.0)	0(0.0)	2(3.9)	2(4.3)
Asian or Pacific Islander	107(54.3)	27(54.0)	24(48.0)	29(56.9)	27(58.7)
Total Household Income	75(38.1)	18(36.0)	22(44.0)	20(39.2)	15(32.6)
Less than \$25,000	1(0.5)	1(2.0)	0(0.0)	0(0.0)	0(0.0)
\$25,001 - \$49,999	11(5.6)	0(0.0)	3(6.0)	8(15.7)	0(0.0)
\$50,000 - \$74,900	20(10.2)	6(12.0)	1(2.0)	2(3.9)	11(23.9)
\$75,000 - \$99,999	37(18.8)	9(18.0)	4(8.0)	14(27.5)	10(21.7)
\$100,000 - \$119,999	54(27.4)	17(34.0)	14(28.0)	11(21.6)	12(26.1)
Over \$120,000	74(37.6)	17(34.0)	28(56.0)	16(31.4)	13(28.3)

Note: (): Percentages may not add to 100 % due to rounding.

Overall, it appears that four experimental groups have similar demographic characteristics. To check an initial difference among the experimental groups in demographics, a chi-square statistic was used. Table 4-2 and 4-3 shows the Pearson chi-square results and indicates that there is no an initial significant difference in gender and age across the experimental groups ($\chi^2 = .330$, $df = 3$, $n = 197$, $p = .954$; $\chi^2 = 5.68$, $df = 9$, $n = 197$, $p = .772$, respectively).

Table 4-2. Chi-square Analysis of Gender among experimental conditions

Variable	<i>n</i>	Conditions				χ^2	<i>p</i>
		Single exposure	Three exposure	Seven exposure	Direct exposure		
Gender						.330	.954
Females	87	23	23	21	20		
Males	110	27	27	27	26		
Totals	197	50	50	51	46		

Table 4-3. Chi-square Analysis of Age among experimental conditions

Variable	<i>n</i>	Conditions				χ^2	<i>p</i>
		Single exposure	Three exposure	Seven exposure	Direct exposure		
Age Group						5.68	.772
>20	54	13	17	11	13		
20-24	50	10	10	16	14		
25-29	28	9	5	8	6		
30≤	65	18	18	16	13		
Totals	197	50	50	51	46		

Hypothesis Testing

Hypothesis 1 predicted that increased exposure to a specific sport while playing video games would lead to a consumer's favorable attitude toward the sport brand. Although subjects were randomly assigned into each of the four treatment groups, there was a possibility that the differences of the results in the treatment groups were attributed

to initial differences in the sample. The results of discrepancy test among the sets of pre-formed attitude mean scores (see Table 4-5) indicated that the means of the exposure conditions did not differ significantly ($F(3, 193) = .634, p = .594$). In order to adjust the post-attitude scores on the pre-formed attitude scores, ANCOVA was conducted. The independent variable was the four exposure conditions (single, three, seven exposures, and direct experience), and the dependent variable was the post-brand attitude scores. Pre-formed NASCAR brand attitude scores were used as the covariate in this analysis. For analysis, summated scores were computed for the subject's pre-formed attitude and post attitude scores. Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, reliable measurement of the covariate, linearity, and homogeneity of regression slopes. The reliability of the measurement scale for the covariate was calculated using Cronbach's alpha and was found to be high (.88). The assumption of a linear relationship between the dependent variable and the covariate for all experimental groups was assessed by checking scatterplots between the dependent variable and the covariate. Figure 4-1 showed there appears to be a linear relationship for each group.

The final assumption of homogeneity of regression slopes was assessed to see whether there is statistically significant interaction between the treatment and the covariate. The results indicated that there were no significant interaction between the covariate and the experimental manipulation (See Table 4-4). Thus, the results of the assumption test indicated that there were no significantly violated assumptions.

Figure 4-1 Scatterplots between Pre- and Post-Attitude for each group

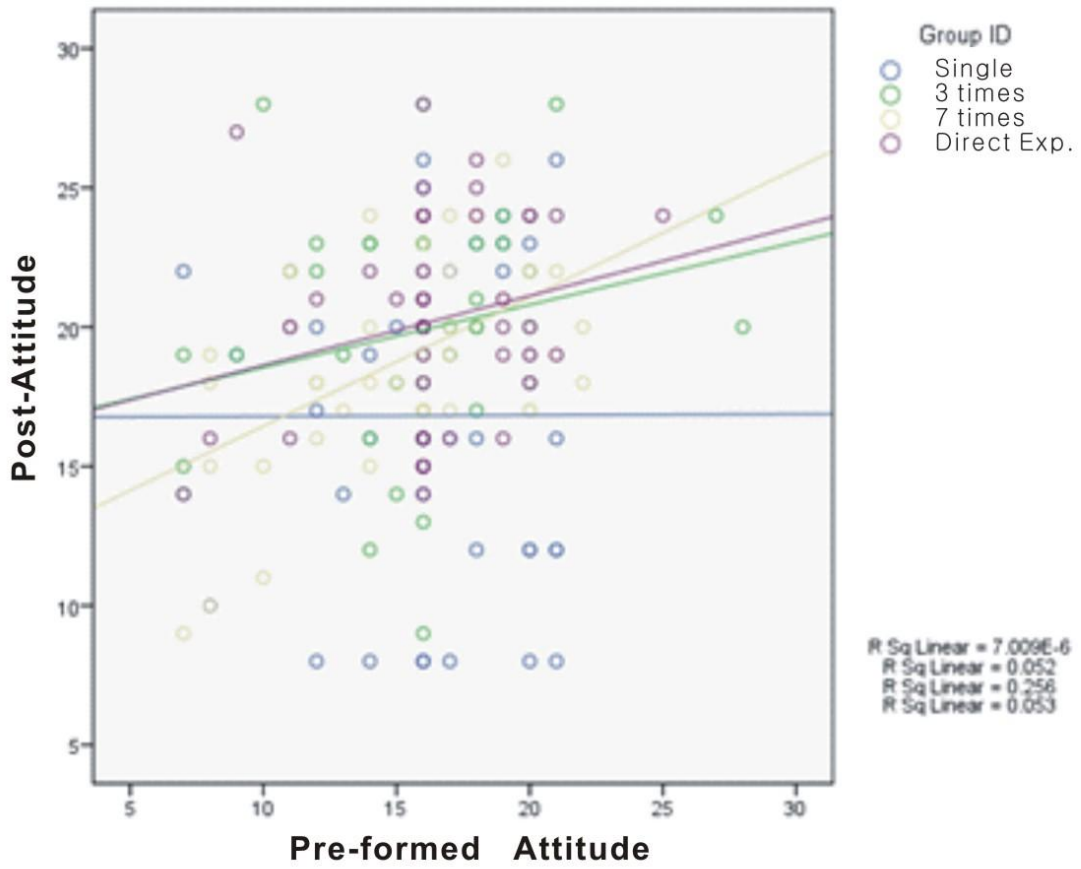


Table 4-4 Tests of Homogeneity of Regression Slopes (Pre- and Post-Attitudes)

Dependent Variable: post attitude

Source	Type III Sum of Squares	<i>df</i>	Mean Square	F	Sig.
Corrected Model	585.779 ^a	7	83.683	5.028	.000
Intercept	2196.706	1	2196.706	131.974	.000
Treatment Group	44.457	3	14.819	.890	.447
Pre-attitude	143.130	1	143.130	8.599	.004
Group *Pre-attitude	70.605	3	23.535	1.414	.240
Error	3145.896	189	16.645		
Total	74545.000	197			
Corrected Total	3731.675	196			

a. R Squared = .157 (Adjusted R Squared = .126)

Table 4-5 presents the results of the ANCOVA test. After adjusting for the effect of the pre-formed attitude, there was a statistically significant difference at the $p < .05$ level in brand attitude scores for the four treatment condition groups, $F(3, 192)=7.22$, $p < .001$, partial eta squared=.10. The coefficient of effect size indicated that 10 % of the variance in brand attitude scores was explained by pre-formed attitude by itself (Levine & Hullett, 2002).

Table 4-5 ANCOVA for Post Attitudes

Source	<i>df</i>	Sum of Squares	<i>F</i> -value	<i>Sig.</i>	<i>Partial Eta Squared</i>
Covariate					
Pre-formed Attitudes	1	170.96	10.21	.002	.05
Main Effect					
Treatments	3	362.90	7.22	.000	.10
Error	192	16.75			

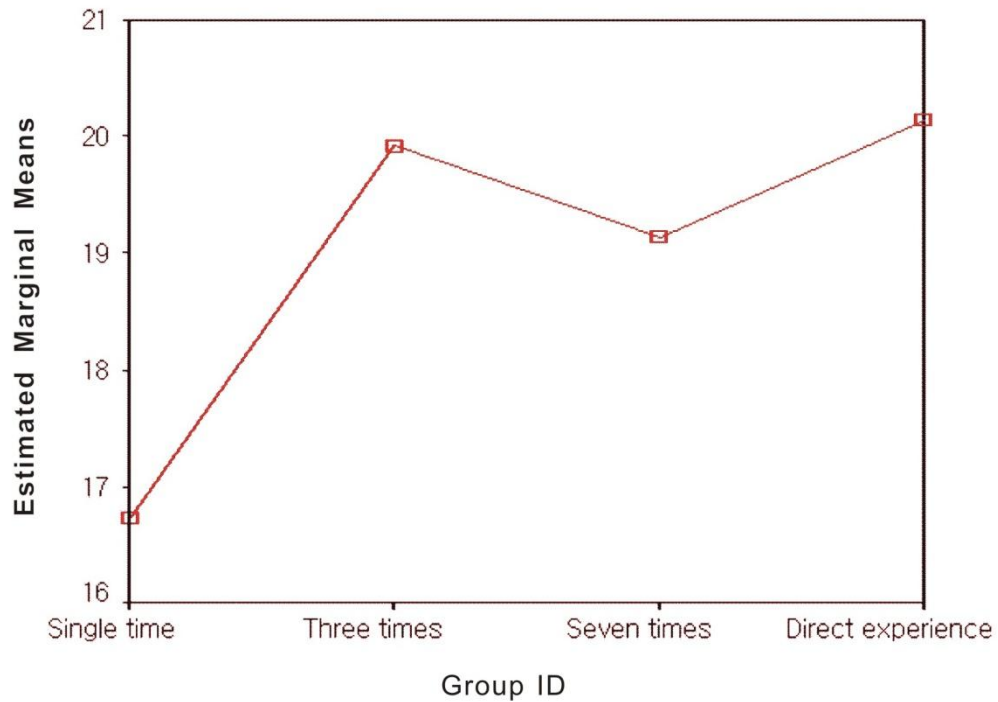
To confirm the significant difference between brand attitude scores across conditions, post-hoc comparisons using the Bonferroni test were conducted. As indicated in Table 4-6, the adjusted mean score for either direct experience ($M=20.14$, $SD=.60$), three ($M=19.92$, $SD=.58$) or seven exposure ($M=19.15$, $SD=.58$) group was significantly different from a single exposure group ($M=16.72$, $SD=.58$). The direct experience group did not differ significantly from either the three or seven exposure group. A plot of the estimated marginal means of post-attitude scores across conditions is given in Figure 4-2.

Table 4-6 Means, Standard Deviations (S.D.), and Adjusted Means for the pre-and post-Attitude

Treatment group	Pre-formed Attitude	Post-Attitude	
	Mean (S.D.)	Mean (S.D.)	Adjusted Mean (S.D.)
Single exposure	16.48 (3.42) ^a	16.82 (5.23)	16.72 (.58) ^a
Three time exposure	15.92 (4.06) ^a	19.88 (3.99)	19.92 (.58) ^b
Seven time exposure	15.57 (3.97) ^a	19.02 (3.63)	19.15 (.58) ^b
Direct experience	16.37 (3.40) ^a	20.22 (3.68)	20.143 (.60) ^b

Note: Means with different superscripts are significantly different from each other at the $p<.001$ level.

Figure 4-2 Estimated Marginal Means of Post-Attitude



Hypothesis 2 predicted that greater repetitive exposure to a specific sport embedded in a SVG will lead to more accessible attitude toward the sport brand. A one-way between-group ANCOVA was performed to compare the effectiveness of four different exposure conditions. The independent variable was four exposure conditions (i.e. single, 3, 7 exposures, and direct experience), and the dependent variable was brand accessibility scores. Subjects' NASCAR brand familiarity and fan identification scores were used as the covariates in this analysis. For analysis, summated scores were computed for the subject's brand familiarity and fan identification level respectively.

Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, reliable measurement of the covariates, linearity, and

homogeneity of regression slopes. Each reliability of the measurement scales for brand familiarity and identification was calculated using Cronbach's alpha and was found to be high (.90 for brand familiarity; .90 for identification respectively). The assumption of a linear relationship between the dependent variable and the covariate for all experimental groups was assessed by checking scatterplots between the dependent variable and each of the covariates. Figure 4-3 and 4-4 showed there appears to be a linear relationship between attitude accessibility and brand familiarity for each group. The final assumption of homogeneity of regression slopes was assessed to see whether there is statistically significant interaction between the treatment and the covariate. The results indicated that there was no significant interaction between sport identification and the experimental group (See Table 4-8), whereas there was significant interaction between brand familiarity and the experimental manipulation (See Table 4-7). The results for homogeneity of regression slopes between attitude accessibility and brand familiarity indicated that the relationship between the covariate and dependent variable for each of the experimental groups is not the same, showing that there was significantly violated assumption. Accordingly, to prevent the misinterpretation of the ANCOVA results, the brand familiarity as a covariate was not used in this hypothesis test (see Stevens, 1996; Tabachnick & Fidell, 2001).

Figure 4-3 Scatterplots between Accessibility and Familiarity for each group

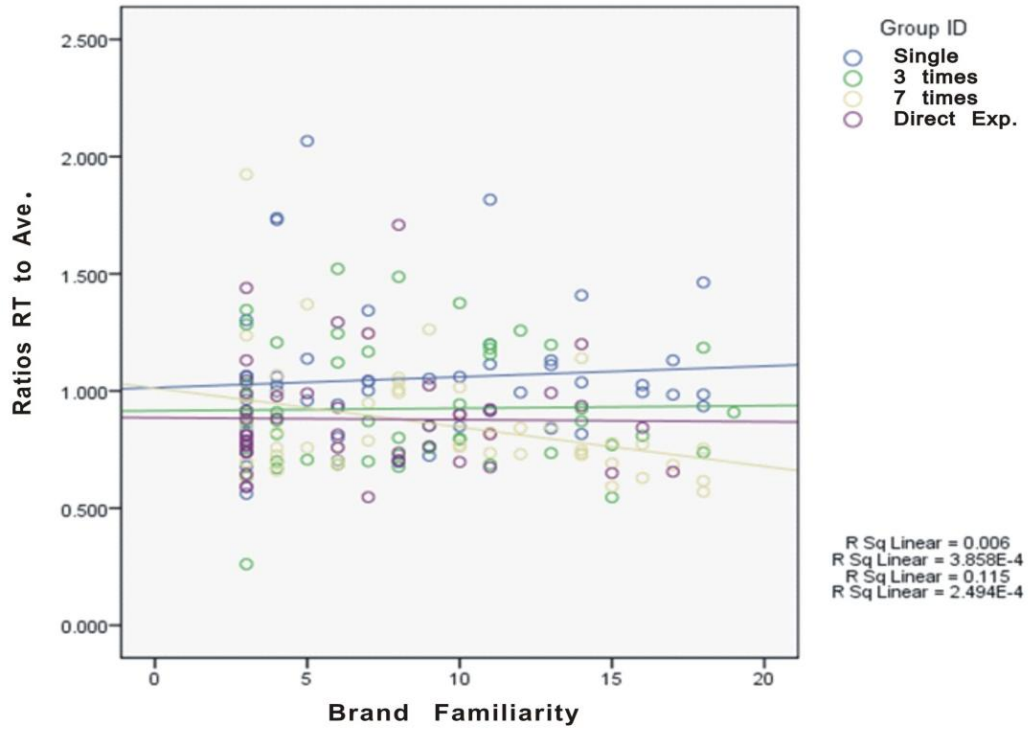


Figure 4-4 Scatterplots between Accessibility and Identification for each group

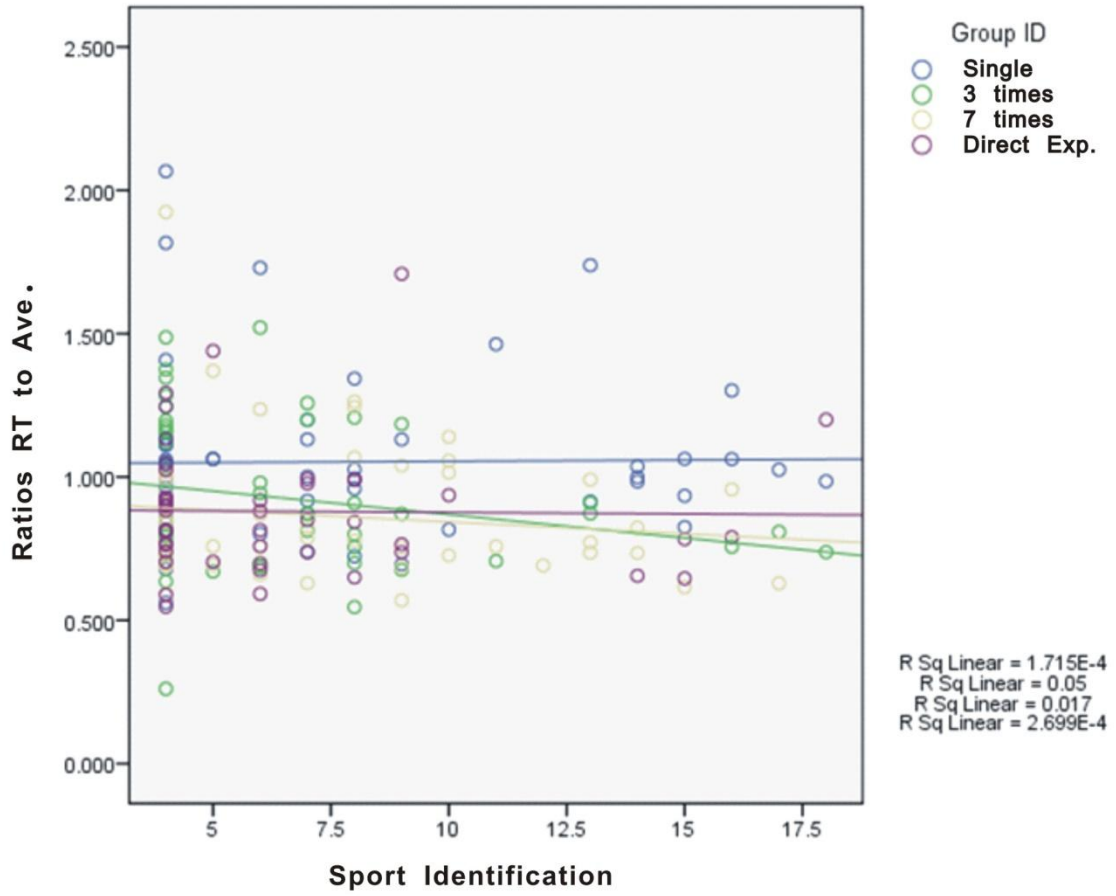


Table 4-7 Test of Homogeneity of Regression Slopes (Attitude Accessibility and Brand Familiarity)

Dependent Variable: Attitude Accessibility

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Corrected Model	1.458 ^a	7	.208	3.146	.004
Intercept	44.008	1	44.008	664.926	.779
Treatment Group	.158	3	.053	.798	.496
Group*Familiarity	.361	4	.090	1.365	.028
Error	12.509	189	.066		
Total	184.638	197			

a. R Squared = .104 (Adjusted R Squared = .071)

Table 4-8 Test of Homogeneity of Regression Slopes (Attitude Accessibility and Identification)

Dependent Variable: Attitude Accessibility

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Corrected Model	1.311 ^a	7	.187	2.797	.009
Intercept	40.818	1	40.818	609.690	.000
Treatment Group	.201	3	.067	1.002	.393
Group*Identification	.130	3	.043	.646	.586
Error	12.655	189	.067		
Total	184.638	197			

a. R Squared = .094 (Adjusted R Squared = .06)

As indicated in Table 4-9, there were no significant effects of fan identification as a covariate on attitude accessibility scores, $F(1,192) = 1.275, p = .260$. The result of the ANCOVA test in Table 4-9 revealed that after adjustment by the covariates, the main

effect of exposure conditions was significant, $F(3, 192) = 5.708$. $p < .001$, partial eta squared=.08). The coefficient of effect size indicated that 8 % of the variance in attitude accessibility scores was explained by exposure condition by itself (Levine & Hullett, 2002).

Table 4-9 ANCOVA for Attitude Accessibility

Source	<i>df</i>	Sum of Squares	<i>F</i> -value	<i>Sig.</i>	<i>Partial Eta Squared</i>
Covariate					
Fan Identification	1	.085	1.275	.260	.007
Main Effect					
Treatments	3	1.140	5.708	.001	.082
Error	192	.677			

To confirm the significant difference between attitude accessibility scores across conditions, post-hoc comparisons using the Bonferroni test was conducted. The results in Table 4-10 indicated that the adjusted mean scores for a direct experience group ($M=.88$, $SD=.038$) was significantly different from a single exposure group ($M=1.06$, $SD=.037$). The direct experience group ($M=.87$, $SD=.038$) did not differ significantly from either of other groups: three ($M=.92$, $SD=.037$) or seven exposure ($M=.87$, $SD=.036$) group. The mean accessibility score of the three time exposure group ($M=.92$, $SD=.037$) was significantly different from that of single exposure group ($M=1.06$, $SD=.037$) at the 0.1 level. The adjusted means on attitude accessibility scores across conditions are presented in Table 4-10.

Table 4-10 Means, Standard Deviations (S.D.), and Adjusted Means for Accessibility

Treatment group	Fan Identification	Attitude Accessibility	
	Mean (S.D.)	Mean (S.D.)	Adjusted Mean (S.D.)
Single exposure	7.92 (4.47) ^a	1.05 (.30)	1.06 (.037) ^a
Three time exposure	6.62 (3.55) ^a	.92 (.26)	.92 (.037) ^{ab}
Seven time exposure	7.53 (3.78) ^a	.86 (.24)	.87 (.036) ^b
Direct experience	6.67 (3.63) ^a	.88 (.23)	.88 (.038) ^b

Note: Means with different superscripts are significantly different from each other at the $p < .05$ level, but there is mean difference between single and three exposure groups at $p < .10$.

In addition, to determine whether there is a particular trend of attitude accessibility scores as a function of the level of exposure (i.e. single, three, and seven exposure), trend analysis as a part of the post-hoc test was conducted using a priori polynomial contrast. The results of the trend analysis indicated there is a significant linear trend, $F(2,147) = 6.862, p=.001$, that was accounted from 8.5% of the within subjects variation for attitude accessibility scores, but, that there was no significant quadratic relationship between repetition and accessibility ($p = .378$) (see Table 4-11 and 4-12). A plot of estimated marginal means of attitude accessibility scores across conditions are given in Figure 4-5. It is important to note that direct experience group in Figure 4-5 only served as a comparison group.

Table 4-11 Polynomial Contrast Results for Attitude Accessibility

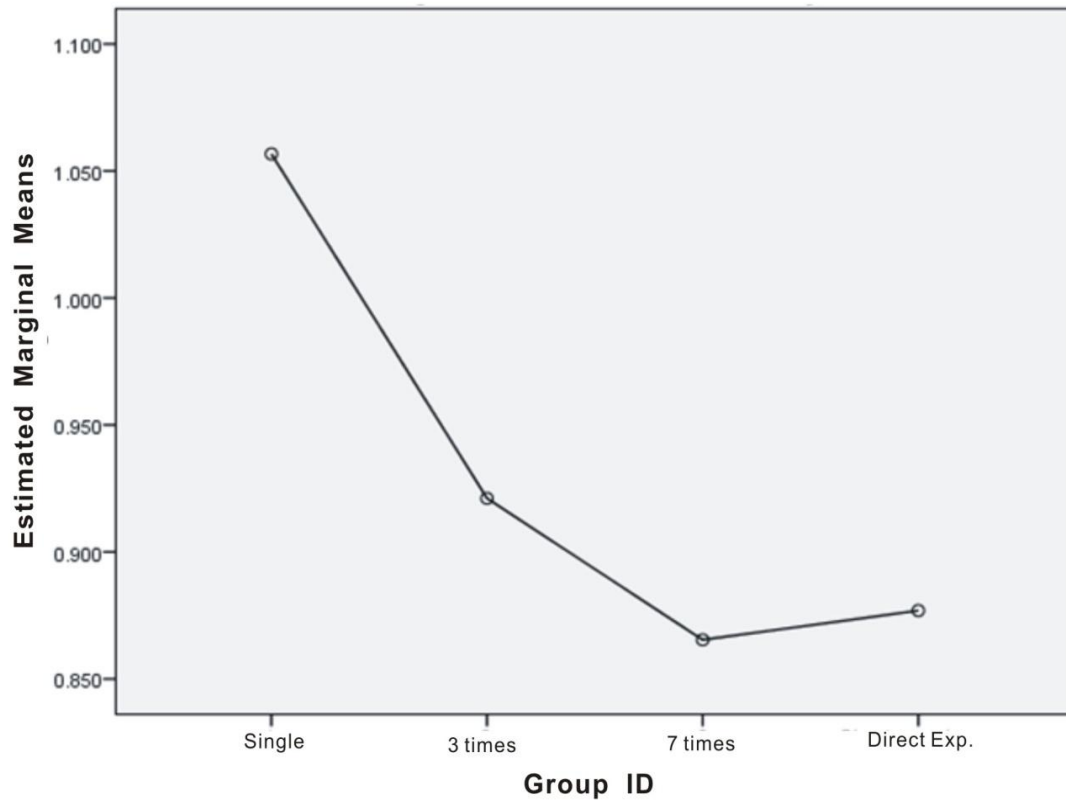
Group ID Polynomial Contrast ^a		Dependent Variable Attitude Accessibility
Linear	Contrast Estimate	-.136
	Hypothesized Value	0
	Std. Error	.038
	Sig.	.000
	95% Confidence Lower Bound	-.210
	Interval for Difference Upper Bound	-.061
Quadratic	Contrast Estimate	.034
	Hypothesized Value	0
	Std. Error	.038
	Sig.	.378

Table 4-12 Contrast Results for Attitude Accessibility

Dependent Variable: Attitude Accessibility

Source	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>	Partial Eta Squared
Contrast	.977	2	.489	6.862	.001	.085
Error	10.471	147	.071			

Figure 4-5 Estimated Marginal Means of Attitude Accessibility



Note. Higher response time (estimated marginal means) indicates lower accessibility

Hypothesis 3 suggested that greater repetitive exposure to a specific sport embedded in a SVG will lead to more confident attitude toward the sport. A one-way between-group ANCOVA was performed to compare the effectiveness of four different exposure conditions. The independent variable was four exposure conditions (single, 3, 7 exposures, and direct experience), and the dependent variable was brand confidence scores. Subjects' NASCAR brand familiarity and fan identification scores were used as the covariates in this analysis. For analysis, summated scores were computed for the subject's attitude confidence, brand familiarity, and fan identification level.

Preliminary checks were conducted to ensure that there was no violation of the assumptions of normality, reliable measurement of the covariates, linearity, and homogeneity of regression slopes. Each reliability of the measurement scales for brand familiarity and identification was calculated using Cronbach's alpha and was found to be high (.90 for brand familiarity; .90 for identification respectively). The assumption of a linear relationship between the dependent variable and the covariate for all experimental groups was assessed by checking scatterplots between the dependent variable and each of the covariates. Figure 4-6 for brand familiarity and Figure 4-7 for identification showed there appears to be a linear relationship between attitude confidence and each covariate for each group. The final assumption of homogeneity of regression slopes was assessed to see whether there is statistically significant interaction between the treatment and the covariate. In Table 4-13, the results indicated that there was no significant interaction between brand familiarity (and identification, see Table 4-14) and the experimental group. The results for homogeneity of regression slopes between attitude confidence and covariates indicated that the relationship between the covariate and dependent variable for each of experimental groups is the same, showing that there was not significantly violated assumption. Thus, the results indicated that there were no significantly violated assumptions.

Figure 4-6 Scatterplots between Attitude Confidence and Brand Familiarity for each group

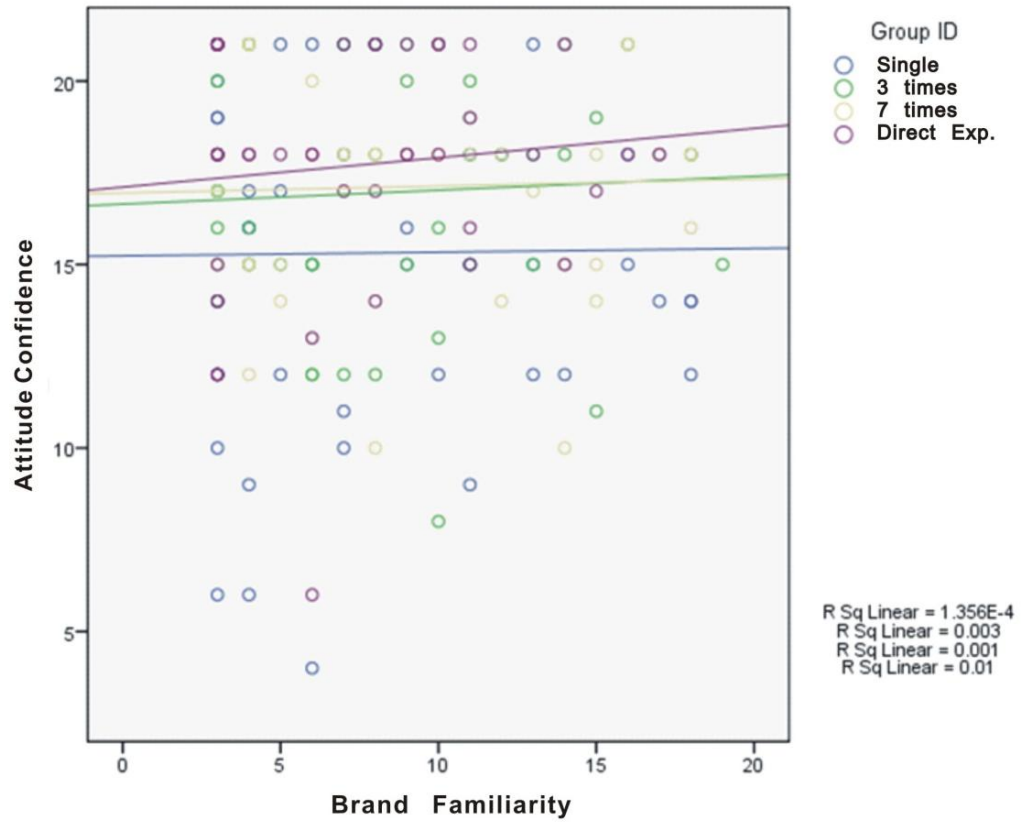


Figure 4-7 Scatterplots between Attitude Confidence and Fan Identification for each group

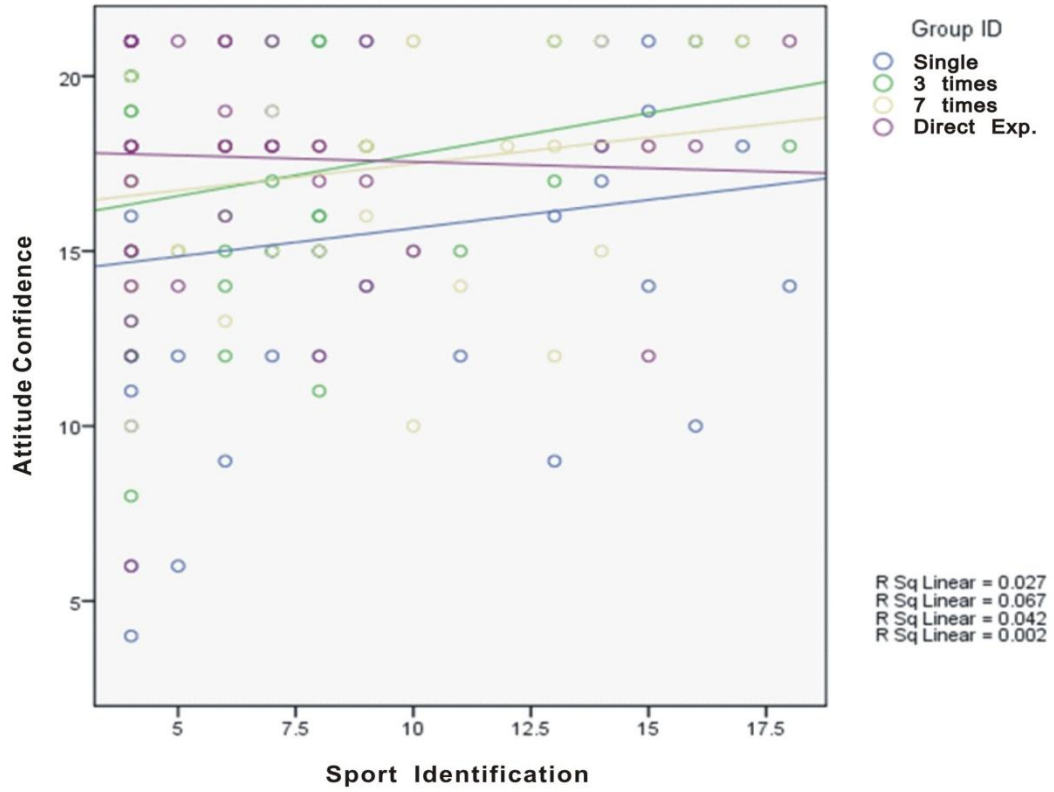


Table 4-13 Test of Homogeneity of Regression Slopes (Attitude Confidence and Brand Familiarity)

Dependent Variable: Attitude Confidence

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Corrected Model	157.666 ^a	7	22.524	1.834	.083
Intercept	13064.321	1	13064.321	1063.766	.000
Treatment Group	27.799	3	9.266	.755	.521
Group*Familiarity	2.642	3	.881	.072	.975
Error	2321.146	189	12.281		
Total	57758.000	197			

a. R Squared = .064 (Adjusted R Squared = .029)

Table 4-14 Test of Homogeneity of Regression Slopes (Attitude Confidence and Fan Identification)

Dependent Variable: Attitude Confidence

Source	Type III Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Corrected Model	227.918 ^a	7	32.560	2.734	.010
Intercept	10816.051	1	10816.051	908.187	.000
Treatment Group	85.389	3	28.463	2.390	.070
Group*Identification	24.816	3	8.272	.695	.556
Error	2250.894	189	11.909		
Total	57758.000	197			

a. R Squared = .092 (Adjusted R Squared = .058)

As indicated in Table 4-15, there were no significant effects of the brand familiarity as covariate, $F(1,191) = .05$, $p = .947$, on attitude confidence scores, but there were significant effects of fan identification on attitude confidence, $F(1,191) = 4.04$, $p <$

.05. The result of the ANCOVA test revealed that after adjustment by the covariates, the main effect of exposure conditions was significant, $F(3,191) = 4.736$, $p < .01$, partial eta squared=.07. The partial eta squared indicated that 7 % of the variance in attitude confidence scores was explained by exposure condition by itself given to groups (Levine & Hullett, 2002).

Table 4-15 ANCOVA for Attitude Confidence

Source	<i>df</i>	Sum of Squares	<i>F</i> -value	<i>Sig.</i>	<i>Patial Eta Squared</i>
Covariate					
Brand Familiarity	1	0.053	.004	.947	.000
Fan Identification	1	48.131	4.040	.046	.021
Main Effect					
Treatments	3	169.279	4.736	.003	.069
Error	191	2275.658			

Note: R Squared = .082 (Adjusted R Squared = .058)

To confirm the significant difference between attitude confidence scores across conditions, post-hoc comparisons using the Bonferroni test was conducted. The results in Table 4-16 indicated that the adjusted mean scores for a direct experience group ($M=17.75$, $SD=.51$) was significantly different from a single exposure group ($M=15.22$, $SD=.49$). The direct experience group ($M=17.75$, $SD=.49$) did not differ significantly from either of other groups: Three ($M=17.04$, $SD=.49$) or seven exposure ($M=17.07$, $SD=.49$) group. The mean confidence score of the three time exposure group ($M=17.04$, $SD=.49$) was significantly different from that of single exposure group ($M=15.22$, $SD=.49$) at the.05 level.

Table 4-16 Means, Standard Deviations (S.D.), and Adjusted Means for Attitude

Confidence

Treatment group	Fan Identification	Brand Familiarity	Attitude Confidence	
	Mean (S.D.)	Mean (S.D.)	Mean (S.D.)	Adjusted Mean (S.D.)
Single exposure	7.92 (4.47) ^a	8.40 (5.05) ^a	15.32 (4.37)	15.22 (.49) ^a
Three time exposure	6.62 (3.55) ^a	8.28 (4.62) ^a	16.96 (3.24)	17.04 (.49) ^{ab}
Seven time exposure	7.53 (3.78) ^a	8.90 (4.89) ^a	17.12 (2.78)	17.07 (.49) ^b
Direct experience	6.67 (3.63) ^a	7.04 (4.17) ^a	17.67 (3.30)	17.75 (.51) ^b

Note: Means with different superscripts are significantly different from each other at the $p < .05$ level.

In addition, to determine whether there is a particular trend of attitude confidence scores as a function of the level of exposure (i.e. single, three, and seven exposure), trend analysis as a part of the post-hoc test was conducted using a priori polynomial contrast. The results indicated there is a significant linear trend, $F(2,146) = 4.829$, $p = .009$, that was accounted from 21.51% of the within subjects variation for attitude confidence scores, but that there was no significant quadratic relationship between repetition and attitude confidence ($p = .124$) (see Table 4-17 and 4-18). A plot of estimated marginal means of attitude confidence scores across conditions are given in Figure 4-8. It is important to note that direct experience group in Figure 4-8 only served as a comparison group.

Table 4-17 Polynomial Contrast Results for Attitude Confidence

Group ID Polynomial Contrast ^a		Dependent Variable Attitude Confidence
Linear	Contrast Estimate	1.329
	Hypothesized Value	0
	Difference (Estimate - Hypothesized)	1.329
	Std. Error	.490
	Sig.	.007
	95% Confidence Lower Bound	.361
	Interval for Difference Upper Bound	2.298
Quadratic	Contrast Estimate	-.766
	Hypothesized Value	0
	Difference (Estimate - Hypothesized)	-.766
	Std. Error	.495
	Sig.	.124
	95% Confidence Lower Bound	-1.744
	Interval for Difference Upper Bound	.212

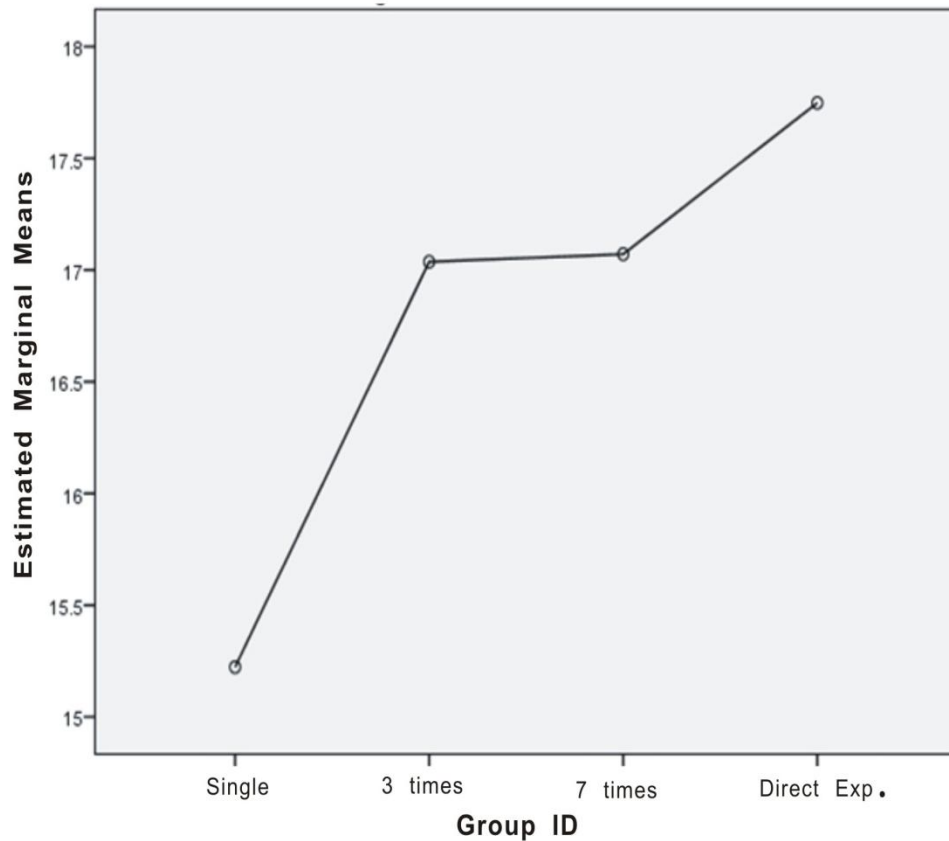
a. Metric = 1.000, 2.000, 3.000

Table 4-18 Contrast Results for Attitude Confidence

Dependent Variable: Attitude Confidence

Source	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Contrast	116.643	2	58.322	4.829	.009	.062
Error	1763.210	146	12.077			

Figure 4-8 Estimated Marginal Means of Attitude Confidence



Hypothesis 4a and 4b suggested that enhanced attitude accessibility and confidence with multiple exposures will moderate the relationship between attitudes and behaviors. Given the findings of previous hypothesis testing that attitudes formed from virtual experience with multiple exposures are as equally accessible and confident as those formed in direct experience, the strength of relationship between attitude and behavior within the exposure conditions was explored using a Spearman rank-order correlation. For the analysis, ranks were substituted for raw attitude scores. The Spearman's correlation coefficient was then calculated. The correlations for each product

were computed within four experiment conditions. The correlation coefficients for each product across conditions are presented in Table 4-19.

Table 4-19 Correlation Coefficients between Brand Attitude and Behavior by Exposure Conditions

Products	Single exposure	Three time exposure	Seven time exposure	Direct experience
Tickets	.303*	.479**	.512**	.600**
Subscription for magazine	.286*	.519**	.586**	.608**
Jersey	.327*	.501**	.556**	.615**
Televised sporting event	.292*	.486**	.575**	.615**
Online sport news	.263	.483**	.538**	.612**
Highlight DVD	.260	.448**	.552**	.662**
Vertical flag/banner	.295*	.507**	.564**	.650**
Desk clock	.250	.477**	.567**	.646**
Key chain	.187	.523**	.549**	.610**
Coffee mug	.210	.483**	.510**	.659**

Note: *p<.05, **p<.01, ***p<.001.

Correlation Coefficients in Table 4-19 present the strength and direction of relationship between attitudes toward NASCAR brand and purchase behavior toward each NASCAR product across the experiment conditions. Overall, the results in Table 4-19 revealed there was significant correlation between attitudes and behaviors within each condition. For example, in choice contexts for coffee mug with NASCAR logo, the Correlation Coefficients in three or seven time exposure and direct experience conditions

showed moderately positive relationships between the brand attitude and choice behavior ($r_s = .483, p < .01$ for three time exposure; $r_s = .510, p < .01$ for seven time exposure; $r_s = .659, p < .01$ for direct experience), whereas the formed attitudes in single time exposure condition are weak correlated with behaviors ($r_s = .210, p = n.s.$).

As expected, the results indicated that there were strong relationships between attitudes and behaviors in the direct experience group ($r_s = .600$ for Sporting event tickets; $r_s = .608$ for magazine subscription; $r_s = .662$ for Highlight DVD; $r_s = .615$ for televised sporting event; $r_s = .612$ for Online sport news; $r_s = .615$ for jersey; $r_s = .646$ for desk clock; $r_s = .650$ for Vertical flag/banner; $r_s = .610$ for Key chain; $r_s = .659$ for Coffee mug at the .01 level). Under choice settings, however, there was a weak or moderate relationship between attitudes and behaviors in single time exposure group (e.g., online news, DVD, clock, coffee mug, and key chain for examples of not significant relationship; tickets, magazine subscription, jerky, televised sporting event, and flag/banner for examples of weak correlation).

In addition, Correlation Pairwise Comparison was utilized to determine if there are significant differences (e.g., correlation coefficients) in the attitude-behavior relationship across the level of exposure. After the correlation coefficient for each product was transformed using the Fisher r-to-Z transformation, the relationship between attitudes toward NASCAR and behavior for NASCAR products was compared within two different groups. The results of Correlation Pairwise Comparison within a pair of experiment conditions presented in Table 4-20 – Table 4-25.

The results of the Pairwise comparison indicated that the correlation coefficients for a single exposure group were significantly different from those of either direct experience or seven time exposure groups (see Table 4-20 and Table 4-22), whereas there is no statistical difference of the correlation coefficients between single and three time exposure groups (see Table 4-21), except for a licensed key chain from NASCAR. For example, as presented in Table 4-20, the correlation between attitude and behavior for sporting tickets (i.e. NASCAR event) was .303 for the single exposure group. For the direct experience group, the correlation was .600. The Z-test statistic is 1.82, p (one tailed) $< .05$, leading to the conclusion that the correlation in the single exposure condition is significantly higher than it is in the direct experience condition. Similarly, the overall results of the analysis in a pair of single and seven time exposure conditions also showed that the strength of relationship between attitudes and behavior in the seven time exposure group were stronger than that in the single exposure group (see Table 4-22). The results indicated that there were significant difference in correlations coefficients between single and seven exposure groups (e.g., for magazine subscription, Highlight DVD, televised sporting event, desk clock, key chain, and Coffee mug at the .05 level).

Under choice settings for all products, however, the direct experience group did not differ significantly from each of the other groups (three and seven time exposure groups) in correlation coefficients between attitude and behavior (see Table 4-23, Table 4-24, and Table 4-25).

Table 4-20 Pairwise Comparison of Correlation Coefficients (Single Exposure vs. Direct Experience)

Products	Single exposure	Direct experience	Pairwise Comparison	
			Z-Statistic	P-value (one tailed)
Tickets	.303	.600	1.802	$P < .05$
Subscription for magazine	.286	.608	1.955	$P < .05$
Jersey	.327	.615	1.789	$P < .05$
Televised sporting event	.292	.615	1.972	$P < .05$
Online sport news	.263	.612	2.098	$P < .05$
Highlight DVD	.260	.662	2.513	$P < .01$
Vertical flag/banner	.295	.650	2.232	$P < .05$
Desk clock	.250	.646	2.431	$P < .01$
Key chain	.187	.610	2.463	$P < .01$
Coffee mug	.210	.659	2.738	$P < .01$

Table 4-21 Pairwise Comparison of Correlation Coefficients (Single Exposure vs. Three Exposure)

Products	Single exposure	Three time exposure	Pairwise Comparison	
			Z-Statistic	P-value (One tailed)
Tickets	.303	.479	1.013	<i>n.s.</i>
Subscription for magazine	.286	.519	1.361	<i>n.s.</i>
Jersey	.327	.501	1.024	<i>n.s.</i>
Televised sporting event	.292	.486	1.115	<i>n.s.</i>
Online sport news	.263	.483	1.249	<i>n.s.</i>
Highlight DVD	.260	.448	1.048	<i>n.s.</i>
Vertical flag/banner	.295	.507	1.234	<i>n.s.</i>
Desk clock	.250	.477	1.278	<i>n.s.</i>
Key chain	.187	.523	1.897	$P < .05$
Coffee mug	.210	.483	1.521	<i>n.s.</i>

Table 4-22 Pairwise Comparison of Correlation Coefficients (Single Exposure vs. Seven Exposure)

Products	Single exposure	Seven time exposure	Pairwise Comparison	
			Z-Statistic	P-value (one tailed)
Tickets	.303	.512	1.231	<i>n.s.</i>
Subscription for magazine	.286	.586	1.839	$P < .05$
Jersey	.327	.556	1.401	<i>n.s.</i>
Televised sporting event	.292	.575	1.726	$P < .05$
Online sport news	.263	.538	1.618	<i>n.s.</i>
Highlight DVD	.260	.552	1.731	$P < .05$
Vertical flag/banner	.295	.564	1.631	<i>n.s.</i>
Desk clock	.250	.567	1.889	$P < .05$
Key chain	.187	.549	2.084	$P < .05$
Coffee mug	.210	.510	1.703	$P < .05$

Table 4-23 Pairwise Comparison of Correlation Coefficients (Three Exposure vs. Direct Experience)

Products	Three time exposure	Direct experience	Pairwise Comparison	
			Z-Statistic	P-value (one tailed)
Tickets	.479	.600	.813	<i>n.s.</i>
Subscription for magazine	.519	.608	.620	<i>n.s.</i>
Jersey	.501	.615	.788	<i>n.s.</i>
Televised sporting event	.486	.615	.882	<i>n.s.</i>
Online sport news	.483	.612	.878	<i>n.s.</i>
Highlight DVD	.448	.662	1.489	<i>n.s.</i>
Vertical flag/banner	.507	.650	1.026	<i>n.s.</i>
Desk clock	.477	.646	1.181	<i>n.s.</i>
Key chain	.523	.610	.609	<i>n.s.</i>
Coffee mug	.483	.659	1.252	<i>n.s.</i>

Table 4-24 Pairwise Comparison of Correlation Coefficients (Seven Exposure vs. Direct Experience)

Products	Seven time exposure	Direct experience	Pairwise Comparison	
			Z-Statistic	P-value (one tailed)
Tickets	.512	.600	.608	<i>n.s.</i>
Subscription for magazine	.586	.608	.163	<i>n.s.</i>
Jersey	.556	.615	.428	<i>n.s.</i>
Televised sporting event	.575	.615	.295	<i>n.s.</i>
Online sport news	.538	.612	.528	<i>n.s.</i>
Highlight DVD	.552	.662	.834	<i>n.s.</i>
Vertical flag/banner	.564	.650	.651	<i>n.s.</i>
Desk clock	.567	.646	.597	<i>n.s.</i>
Key chain	.549	.610	.438	<i>n.s.</i>
Coffee mug	.510	.659	1.087	<i>n.s.</i>

Table 4-25 Pairwise Comparison of Correlation Coefficients (Three Exposure vs. Seven Exposure)

Products	Three time exposure	Seven time exposure	Pairwise Comparison	
			Z-Statistic	P-value (one tailed)
Tickets	.479	.512	.213	<i>n.s.</i>
Subscription for magazine	.519	.586	.471	<i>n.s.</i>
Jersey	.501	.556	.372	<i>n.s.</i>
Televised sporting event	.486	.575	.605	<i>n.s.</i>
Online sport news	.483	.538	.363	<i>n.s.</i>
Highlight DVD	.448	.552	.678	<i>n.s.</i>
Vertical flag/banner	.507	.564	.390	<i>n.s.</i>
Desk clock	.477	.567	.604	<i>n.s.</i>
Key chain	.523	.549	.178	<i>n.s.</i>
Coffee mug	.483	.510	.175	<i>n.s.</i>

CHAPTER FIVE: DISCUSSION

General Discussion

This study has explored the effects of repeated exposure to a sport brand in a video game on brand attitudes, several non-evaluative dimensions of attitudes, and the consequent attitude-behavior consistency. Sport identification and brand familiarity were identified as two important covariates underlying these processes as they interact to influence attitudes toward the brand embedded in the game and the attitude strength. This chapter contains a summary of the findings and a detailed discussion regarding the meaning of these key findings. It is also discussed that both the theoretical implications of the results for media and consumer research and the practical implications for marketers and sport organizations who are interested in using sport video games as a marketing tool. This is followed by a discussion of the limitations of this study and suggestions for future research.

Summary of Main Findings and Discussion

Effects of Repetitive Brand Exposure on Brand Attitudes

In this study, subjects showed favorable attitudes toward a specific sport brand embedded in the game. In three experiments, subjects were exposed to the NASCAR brand embedded in a NASCAR themed video game either once, 3 times, or 7 times, and then expressed their attitudes toward the brand. Subjects' favorable brand attitudes in this experiment support the speculation that the relationships between exposure frequency and favorability of attitude are clearly positive (Cacioppo & Petty, 1979; Berger & Mitchell, 1989). The results of the current study showed that increased exposure to a sport brand

embedded in videogames result in favorable attitudes toward the brand. Thus, this finding is consistent with that of Zajonc (1968) and Gupta and Lord (2000), who also found that preference for objects is increased by simply repeating exposure to the object.

Although increased exposure to brands led to favorability of attitudes, the finding opposes the common assumption in the field of advertising that there is an inverted U-shaped relationship between message repetition and message effectiveness such as attitudes (Anand & Sternthal, 1990; Vakratsas & Ambler, 1999). For example, Miller (1976) pointed out a saturation point at which further exposure decreased evaluation. That is, subjects generate positive thoughts about new stimuli at low levels of repetition and then have negative reactions to them with further repetition (Cacioppo & Petty, 1979; Calder & Sternthal, 1980). Berlyne (1970) also suggested the negative response to the novel stimuli occurs when additional exposure results in the tedium of the stimuli.

Within this paradigm, it can be inferred that there would be an inverted U-shaped relationship between repetitive video game play and sport brand attitudes at a saturation point. However, the findings indicated a linear trend of attitude scores as a function of the level of exposure. That is, as the level of repetitive game play increases, favorable attitudes toward brand embedded in the game increase. In the current study, this does not explain why the repetition effect of video gaming on brand attitudes is different from that of repetitive advertising in previous studies (see Berger & Mitchell, 1989). One likely explanation for this finding may have to do with the differential levels of pleasure produced through repetitive video game play. According to Kim and Ross (2006), one of the primary motives for playing SVGs is entertainment. Video games have the capacity to

elicit pleasant feelings. As such, after several repetitions of video gaming, the promoted brand alone later would elicit a similar pleasant affective response toward the brand rather than tedious feelings. Thus, the results of these studies lead to speculation that a repetitive video game experience may impact attitudes toward SVGs in a favorable way, and then the pleasure generated from video gaming may transfer to a positive attitude toward the actual sport. It is worthwhile to note that pleasurable gaming experiences may lead to positive attitudes toward the game and the promoted brand. In other words, the SVG experience may reinforce the actual sport brand images.

Main Effects of Repetitive Brand Exposure on Attitude Strength

While previous research on repetitive exposure to brands has been conducted in the field of advertising and marketing, past research in the field of sports has not examined how consumers evaluate these brands embedded in SVGs. This study found that through sport video gaming, repeated exposure to sport brands results in attitudes toward a specific sport that are more accessible from memory, and held with more confidence than a single exposure to sport brands. Furthermore, the results indicate that repeated exposures to a sport brand embedded in the video game can yield attitudes that are as accessible from memory, and held with as much confidence as attitudes formed on the basis of direct experiences. This finding is consistent with those of Berger and Mitchell (1989), who found that repeated message exposure in advertising affects non-evaluative dimensions of attitudes such as attitude accessibility and attitude confidence. These results not only replicate and support the findings of previous studies about the effects of repeated brand exposure on non-evaluative dimensions of attitudes, but also

extend those findings into a new domain. The study shows important evidence that sport video games have potential as a marketing tool that can influence non-evaluated dimensions of attitudes as well as their evaluative dimension.

While previous research results (Berger & Mitchell, 1989) suggest directional support for the hypotheses developed in this study, it can be inferred in the present study that under repetitive exposure conditions, virtual experience such as sport video gaming has a greater impact on both attitude accessibility and confidence than indirect experience such as advertising. The magnitude of the difference between the direct and virtual experience conditions in this study is not as large as the differences in accessibility between attitudes formed on the basis of direct and indirect experiences found in previous studies (Berger & Mitchell, 1989). Berger and Mitchell (1989) utilized advertising as indirect experience to explain the possibility that repeated exposure to advertising can create attitudes that are as accessible as attitudes based on direct experience. However, they failed to prove that attitude accessibilities in direct experience and indirect experience with repeated exposure conditions do not differ at conventional levels of statistical significance ($p > .05$). Conversely, the results of this study suggest that it is possible to create attitudes via virtual experience that are as accessible as those based on direct experience. This provides new insight into the value of SVGs that SVGs are capable of creating attitudes as accessible from memory as attitudes based on direct experiences.

In this study, it was also expected that subjects who are highly identified with a sport will have attitudes toward the sport that are highly accessible from memory, and

held with more confidence than those at low level of sport identification. Under experimental conditions, however, the impact of sport identification and familiarity on attitude accessibility and confidence was not as strong as expected. This indicates that repeated exposures to a sport brand can influence attitude accessibility and attitude confidence, regardless of whether individuals are at any level of sport identification and brand familiarity.

Effects of Repetitive Exposure on the Relationship between Attitudes and Behavior

Given the present findings that repeated exposures to a sport brand within a video game can yield attitudes easily accessible from memory and held with a high level of confidence, the moderating effects of attitude accessibility and confidence resulting from repetitive brand exposure on the relationship between attitudes and behavior was examined. Far more subjects repeatedly exposed to a sport brand than those exposed to the brand a single time showed a strong relationship between brand attitudes and purchase behavior in a variety of brand choice situations. This is consistent with Berger and Mitchell (1989) and Fazio et al. (1989)'s findings. Fazio et al. (1989) examined the role of attitude accessibility in the attitude-to-behavior process, assuming that attitudes guide a corresponding behavior. They found that subjects with highly accessible attitudes toward a given object showed greater attitude-behavior consistency than did those with less accessible attitudes. In other words, attitude accessibility played a moderate role in the relationship between attitudes and behavior. Support for this finding can also be seen in Berger and Mitchell's study (1989). They found that attitudes formed on the basis of repeated exposure to a brand promoted in an advertisement resulted in increased

purchases of that brand, focusing on the role of attitude accessibility and attitude confidence in the attitude-to-behavior process. Not only did the findings in the current study provide support for the previous research results, but also for the proposition that attitudes based on repeated exposure to a sport brand within SVGs are highly predictive of subsequent brand choice behavior.

In addition to the main effects of repetitive sport video game play, the findings also revealed additional interesting results. Despite the subjects' unfamiliarity with the sport brand (NASCAR), this study did find a main effect of repetitive game playing on brand choice behavior. Support for this finding can be seen in the subjects' response from the brand familiarity question. For example, among the subjects who had no experiences with the sport brand (NASCAR), many of them selected the brand as their most preferred brand in brand choice situations. This finding was consistent with those of research investigating the mere exposure effects (Sawyer, 1981; Zajonc, 1968). Findings of previous research on mere exposure effects suggested that mere exposure to an object can influence attitudes toward the object and subsequent behavior without extensive cognitive operations (Zajonc, 1968). In the current study, it can be inferred that the favorability of attitudes resulting from repeated exposure had facilitated subsequent purchase behavior. Conversely, some researchers went on to argue that when new information was encountered, people are more likely to invest large amounts of cognitive resources to process the information. In the current study, it seems that because the presence of a sport brand in the video game was novel and its information was particularly new and prominent during encoding, it was likely to capture greater attention

to the sport, and thereby prompt more extensive cognitive elaboration (Srull & Wyer 1989; Wyer & Srull, 1986). That is, extensive cognitive elaboration may occur because of a lack of resources available to process the sport brand within the game. According to the elaboration likelihood model (ELM), because attitude strength is dependent on the amount of cognitive resources devoted to processing the information, an attitude formed from careful deliberation about an attitude object are stronger than that formed from simple decision rules such as memory-based heuristics (Petty & Cacioppo, 1986). In regards to previous findings about ELM, cognitive elaboration about the sport brand may have led to strong attitudes toward the sport and, in turn, subsequent purchase behavior.

Theoretical Implications

This study is among the first to examine how sport video games work from a consumer learning perspective. To understand the nature of virtual sport experience, this study adopted consumer learning in a mediated environment as a major theoretical framework. This study demonstrated not only that the video gaming repetition affects brand attitudes and their strength, but also that virtual sport experience creates brand attitudes that are as accessible, and held with as much confidence as those formed on the basis of direct experience. The findings here are consistent with those of Zajonc (1968) and Berger and Mitchell (1989). The findings in this study can be helpful in enhancing our general understanding of how repetitive exposure to brands occurring simultaneously with game playing influences both evaluative and non-evaluative dimensions of attitudes toward the promoted brands.

In addition, building upon the previous research on the repetition effects of advertising, this study further demonstrated the moderating role of attitude strength on attitude-behavior consistency. A similar research idea was initially proposed by Berger and Mitchell (1989) that examined the effects of advertising repetition on two non-evaluative dimensions of attitudes and the attitude-behavior relationship rather than effects of video gaming. In their study, it was proposed that by creating more favorable attitudes toward the promoted brand, advertising can influence purchases of that brand. In other words, it is assumed that advertising must first create a positive evaluation of a given object to produce a corresponding change in behavior. However, the current study showed that video gaming repetition may influence brand choice behavior without brand evaluation. This finding is consistent with those of Zajonc (1968) and Fazio et al. (1989), who found that non-evaluative dimensions of attitudes play a moderator role in the attitude-to-behavior process. This study helps to advance the body of work on the role of attitude strength in the attitude-behavior relationship by emphasizing the repetition effects of video gaming in understanding brand attitude formation and a player's processing of brand information associated with the game while playing the video game.

Furthermore, this study takes a step toward advancing the body of literature on new media effectiveness by demonstrating the relationship between video gaming repetition and its effects. In advertising literature, the typical findings have indicated that advertising repetition had a curvilinear (inverted U-shaped) effect on attitudes toward the promoted brand. This accepted explanation for these results in the advertising "wearout" literature is that there is a point in which advertising repetition generate negative

reactions to the advertised brand due to its tedium effect (Berger & Mitchell, 1989). Conversely, the findings in this study indicate the linear pattern of the relationship between video gaming repetition and brand attitudes. In other words, as the frequency of video gaming increases, attitude valence also positively increases. One possible explanation of these results is that pleasure generated from video gaming may transfer to positive attitudes toward the brand. The findings provide new insight into the value of SVGs as a promotional tool designed to blend a sport brand with entertainment. This study also shows that the concept of mere exposure introduced by Zajonc (1968) is equally applicable in the video game context.

Practical Implications

As sport video games (SVGs) have become a popular entertainment source among sport fans, issues regarding how to use SVGs effectively as a marketing tool and how to measure the effects of sport video games on consumer experiences become important to advertisers and marketers. This study may be useful to practitioners who want to increase brand awareness and enhance brand attitudes by incorporating their brands into video games. The finding that subjects with repetitive video game play showed more favorable attitudes toward a sport brand than those with a single-time play implies that brand attitudes may be greatly enhanced by repetitive exposure to a sport brand embedded in SVGs. It will be important for marketers to identify and utilize various strategic ways to get people to consumer sport brands. This study provides insights into how marketers can improve their decision-making regarding how to utilize SVGs and which media to choose for brand attitude enhancement.

The findings emerging from this study suggest that brand attitudes may be greatly improved by repetitive exposure to a sport brand embedded in SVGs. Marketers should be encouraged to utilize SVGs as an advertising tool without concerns about the intrusive nature of advertising. As mentioned earlier, the mere exposure effect in the field of advertising suggests that repetitive exposure to advertising will heighten consumer's awareness and attitudes toward the advertised brand (Sawyer, 1981; Zajonc, 1968). Conversely the advertising wearout literature indicates that too much repetition generates consumers' negative evaluation about the advertisement. Subsequently, due to tedium effect brands promoted in the ads were negatively evaluated. Unlike the findings of previous research in advertising literature, however, this study demonstrated that the more someone plays a SVG, the more favorably they evaluate the sport promoted in the game. Game players' more positive attitudes toward the sport brands suggest that marketers using SVGs as a marketing tool need to be less concerned about the possibility of adverse reaction to SVG playing.

In addition, marketers need to consider the level of involvement game players have with a game in order to maximize the benefits of repeated brand exposure. Even though this study did not focus on the effects of game involvement on brand attitudes, some researchers have examined involvement and change in attitude. Involvement can be defined as a behavioral construct, with varying operationalizations such as repeat playing or a cognitive construct (Rothschild, 1984; Shank & Beasley, 1998), such as interest in a SVG. This line of research suggests that the level of involvement in media may lead to higher repetitive use of the media, and subsequently higher repetition of exposure to

brands promoted in the media. In the real world, it is true that SVGs which are interactive and realistic are more likely to attract a very large number of people to play the games (Kim & Ross, 2006). Furthermore, most of game players play the same game repeatedly until they master the game.

Along with the findings in this study, if brand awareness and attitudes are accepted as an important goal of marketing activities, stimulating game players to be highly involved in their game playing may be a good strategy. For instance, the annual NFL video game competition for promoting the Super Bowl event currently encourage game players to participate in SVG contests to win prizes for the best game performance (e.g. Madden NFL Football, 2004). It is possible that monetary incentives are likely to stimulate game players to be highly involved in their game playing. Subsequently, their high game involvement may lead to higher repetitive exposure to sport brands (Kim, Walsh, & Ross, 2008). Thus, marketers need to find appropriate promotions that will encourage people to play SVGs.

Additionally, marketers should be encouraged by the finding regarding the repetition effects of sport video gaming on attitude strength for the brand and the attitude-behavior consistency. In this study it appears that the attitude accessibility and confidence play a moderate role in the relationship between attitude and behavior. That is, the desired behavior is most likely to occur if the attitude is highly accessible from memory and held with more confidence. The findings also provide important evidence that SVG is a unique and effective medium to promote the desired consumer behavior. Therefore, if the goals of marketing communication are to develop positive brand image and attitudes

that influence purchase behavior, marketers should utilize SVGs as marketing tool to achieve their goal because SVGs are capable of creating positive attitudes toward the products or service that may produce a corresponding change in behavior.

Limitations and Future Research

While this study provides support for the idea that the repeated exposure to sport brands within video games can produce favorable attitudes toward the sport, increased levels of attitude confidence and accessibility, and the attitude-behavior consistency, several limitations of the current study lead to opportunities for future research.

First, a NASCAR themed sport game was used for virtual sport experience in this study. The use of ‘the 2006 NASCAR’ as SVGs has been viewed as an appropriate in experimental design because the game emulating NASCAR is very realistic and interactive; and a broad range of subjects can be recruited without worrying about gaming skills or confusion caused by complexity of the game. Although the choice of the NASCAR game seemed appropriate for this study, the NASCAR game is not representative of all SVGs. It is possible that the results could be different if a participant were to play a different sport video game. Therefore, future researchers should consider replicating this study with different types of sport video games which replicate other sport leagues such as the National Football League (NFL), Major League Baseball (MLB), and Professional Golf Association (PGA). Another limitation of the used game revolves around the effects of outdated game and technology. Given the development of new audio-visual technologies, there is a need to examine how playing the latest SVGs influences brand attitude and response to the games when players are exposed to sport

brand on up-to-date video game consoles such as PlayStation 3. Thus, the generalizability of the findings from this study may be limited to the NASCAR brand in a game context in which players play an outdated game on PlayStation 2. Future studies need to replicate the present study across other latest SVGs, to see if they hold for other types of sport games.

Second, one procedure in the experimental design that may have contributed to the lack of statistical significance in the effects of covariates such as sport fan identification and brand familiarity is the immediate measurement for attitude strength. In this study, attitude accessibility and confidence was measured by asking subjects respond in the immediate condition right after playing the game, in order to ensure comparability of the results with earlier studies (Berger & Mitchell, 1989). However, the impact of the identified covariates on attitude accessibility and confidence was not as strong as expected based on previous findings. This probably occurred because the measurement condition employed in this study was immediate by nature. Chattopadhyay and Nedungadi (1992) suggested that using immediate measurement of response to stimulus in an experimental setting might increase the accessibility of message cognitions and its attitude in consumer memory. However, this study does not directly address the issue of the impact of delay on the relationship between repetitive video gaming and brand attitudes. To avoid this problem, it would be useful for future research to examine the longer term effects of sport video gaming on brand attitudes and attitude strength by varying the level of the delay between exposure and measurement.

Third, subject fatigue caused from the 50-60 minute experiment may have influenced on the accuracy of subjects performance. Social science researchers have consistently demonstrated the effects of fatigue on subjects' abilities to perform a task with accuracy. However, this study does not address the issues regarding the effects of fatigue bias on the research results. Therefore, future research should address and control the impact of fatigue bias. Future research should also directly examine the impact that user manipulation of the game controller has on brand attitudes. Studies should be conducted which measure the game players comfort level with the game controller, perceived game play expertise, and how much they indicate that they were paying attention to the manipulating the controller and not what appeared on the television screen. This would then allow for determination if the levels of brand attitudes will be different for individuals with varying levels of game play and controller expertise.

Forth, brand preference rather than actual purchase behavior was measured in the study. While brand preference can be a valid and reliable predictor of actual brand choice behavior, future research should directly measure behavior to examine the impact that brand attitudes formed from video game play has on actual consumption behavior.

Finally, the student sample used in this study has limitations. The data reported here may reflect virtual sport experiences among the relatively old and highly educated game players due to the large number of graduate students. The sample may not be representative of the student population. As a result, the student sample may reduce power of generalization to undergraduates and graduate students enrolled at a large Midwestern university in the fall of 2008. Therefore, a random sample from the

population should be included in future research to increase generalizability of findings of the present research.

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Appendix A

Recruitment E-mail

Dear Student,

Greetings! I am a graduate student doing a research project on consumer learning through the use of videogame. I want to invite you to participate in this study I am conducting to better understand consumer attitude and behaviors in a virtual environment. Your participant in this study is extremely important and will help achieve the purpose of this study.

Your participation is voluntary and what you need to do in the experiment is either to play a videogame or to watch a sporting event, and then complete a set of questionnaires and will take about 40 minutes to complete.

For participating in the study, you will be given a chance 1) to win a \$50, \$20, or \$10 gift card and 2) to win two tickets to a 2009 sporting event.

If you would like to participate in the videogame study, please email back to me.

All information you provide will be confidential and will not be released to anyone other than the researcher. If you have any questions or comments about this project, please feel free to contact me. My email is kimxx605@umn.edu. Thank you very much for your time and consideration.

Sincerely,

Yongjae Kim, Ph.D. student
School of Kinesiology
University of Minnesota
210 Cooke Hall
1900 University Avenue SE
Minneapolis, MN 55455
Phone Number: (612) 624-2887
FAX Number: (612) 626-7700

Appendix B

CONSENT FORM

[Sport Video Games: The Effects of Virtual Sport Experience on Attitude and Attitude Strength]

You have been invited to be in a research study concerning the consumer learning relative to video gaming. If you agree to participate in the study you will be asked to read this form and then to participate in an experiment which should take no more than 90 minutes of your time.

This study is being conducted by Yongjae Kim, Doctoral candidate of Sport Management, School of Kinesiology, University of Minnesota

Background Information:

The purpose of this study is to better understand consumer learning and attitude formation process through the use of sports video games as a popular entertainment phenomenon. This study focuses on the fundamental understanding of sports video games, how to form their attitude toward a real-life sport, and the relationship between attitude and behavior. This study's findings will help researchers extend to develop a better understanding of media consumers behaviors. The implications of this study's findings also are important for sport marketers and sport marketing researchers in terms of the development of better service and the understanding of consumer behaviors in a virtual environment.

Procedures:

If you agree to be in this study, you will be assigned to either one of experimental groups or a reference group. In experimental groups, you will be asked to play a videogame for 15, 25, or 35 minutes after a trial session. In the reference group, you will be asked to watch a real-life sporting event on television. Next, you will be asked to complete the questionnaire and computer-based tests regarding your experience with either the video game or the television viewing. The complete instructions can be found on the actual questionnaire. After completing the questionnaire and tests, you will be asked to hand it in to an experimenter.

Risks and Benefits of Being in the Study

There are no physical or psychological risks associated with participation in this study and completing this questionnaire. However, the information that you provide to the study will allow researcher to gain a better understanding of the sport consumers who play sport video games. In addition, for participating in the study you will be given an

opportunity to win one of \$50, \$20, and \$10 gift card and to win two tickets to a 2009 sporting event.

Confidentiality:

All your statements and answers will be kept strictly confidential. Your name and any other information that may help to identify you will be not collected, so you cannot be connected with your responses. In addition, individual responses will not be identified or reported. Research information will be kept in a locked computer file; only the researcher will have access to the information.

Voluntary Nature of the Study:

Your decision whether or not to participate will not affect your current or future relations with the University of Minnesota. If you decide to participate, you are free to withdraw at any time without affecting those relationships.

Contacts and Questions:

The researcher conducting this study is Yongjae Kim. You may ask any questions you may have with the study. If you do have questions, you may contact the investigator at the following address:

Yongjae Kim, Ph.D. student
School of Kinesiology
University of Minnesota
210 Cooke Hall
1900 University Avenue SE
Minneapolis, MN 55455
Phone Number: (612) 624-2887
FAX Number: (612) 626-7700

If you have any questions or concerns regarding the study and would like to talk to someone other than the researcher(s), contact Research Subjects' Advocate line, D528 Mayo, 420 Delaware Street S.E., Minneapolis, Minnesota 55455; telephone (612) 625-1650.

Appendix C

PRE-TEST (Questionnaire 1)

The purpose of this questionnaire is to record your background and experience with NASCAR in particular.

Gender: _____ Female _____ Male

Age: _____ years old

Ethnicity: _____Black/African American _____Native American _____Hispanic
 _____White/Caucasian _____Asian or Pacific Islander _____Other

1. Please indicate your experience with the NASCAR brand in general by circling the most appropriate number.									
Unfamiliar	1	2	3	4	5	6	7	Familiar	
Inexperienced	1	2	3	4	5	6	7	Experienced	
No information	1	2	3	4	5	6	7	A great deal of information	

2. For each of the items below, circle the number that best describes your overall feelings about the NASCAR brand.									
A very bad brand	1	2	3	4	5	6	7	A very good brand	
Very unsatisfactory	1	2	3	4	5	6	7	Very satisfactory	
Dislike extremely	1	2	3	4	5	6	7	Like extremely	
Very unfavorable	1	2	3	4	5	6	7	Very favorable	

3. Please indicate whether you strongly disagree or strongly agree with each statement from your perspective by circling the appropriate number.									
						Strongly Disagree			Strongly Agree
NASCAR is my favorite sport.	1	2	3	4	5	6	7		
Being a fan of NASCAR is very important to me.	1	2	3	4	5	6	7		
I consider myself to be a “real” fan of NASCAR.	1	2	3	4	5	6	7		
I want others to know that I am a fan of NASCAR	1	2	3	4	5	6	7		

PRE-TEST (Questionnaire 2)

For each of the items below, circle the number that best describes your overall feelings about the NASCAR brand you saw in the videogame.

A very bad brand	1	2	3	4	5	6	7	A very good brand
Very unsatisfactory	1	2	3	4	5	6	7	Very satisfactory
Dislike extremely	1	2	3	4	5	6	7	Like extremely
Very unfavorable	1	2	3	4	5	6	7	Very favorable

How certain are you of the accuracy of the responses you gave in the previous questions regarding your feelings toward the NASCAR brand?

Not confident	1	2	3	4	5	6	7	Confident
Not sure	1	2	3	4	5	6	7	Pretty sure
Uncertain	1	2	3	4	5	6	7	Certain

Appendix D

SHORT SURVEY (Main Study)

Please indicate the extent to which you are familiar with the NASCAR brand.								
Unfamiliar	1	2	3	4	5	6	7	Familiar
Please indicate the previous experience you had with the NASCAR brand.								
Inexperienced	1	2	3	4	5	6	7	Experienced
Please indicate the extent to which you feel you have enough information to make a judgment about the NASCAR brand.								
No information	1	2	3	4	5	6	7	A great deal of information

2.For each of items below, circle the number that best describes your overall feelings about the NASCAR brand.								
A very bad brand	1	2	3	4	5	6	7	A very good brand
Very unsatisfactory	1	2	3	4	5	6	7	Very satisfactory
Dislike extremely	1	2	3	4	5	6	7	Like extremely
Very unfavorable	1	2	3	4	5	6	7	Very favorable

3.Please indicate whether you strongly disagree or strongly agree with each statement from your perspective by circling the appropriate number.								
						Strongly Disagree		Strongly Agree
NASCAR is my favorite sport.	1	2	3	4	5	6	7	
Being a fan of NASCAR is very important to me.	1	2	3	4	5	6	7	
I consider myself to be a “real” fan of NASCAR.	1	2	3	4	5	6	7	
I want others to know that I am a fan of NASCAR	1	2	3	4	5	6	7	

4. Personal Information

- Please tell me a little about yourself by checking the appropriate responses.

4-1. What is your age? _____

4-2. What is your gender? _____ Female _____ Male

4-3. What is your ethnicity?

____ Black/African American ____ Native American ____ Hispanic

____ White/Caucasian ____ Asian or Pacific Islander ____ Other

4-4. What marital status are you in?

____ Single ____ Married ____ Domestic Partnership

____ Divorced/Separated ____ Widowed

4-5. What is the highest level of education you have completed?

____ Some high school ____ Some college

____ High school ____ Bachelor's

____ Trade/Vo tech ____ Advanced higher education

4-6. What best describes your total household income?

____ Less than \$25,000 ____ \$25,001-\$49,999 ____ \$50,000-\$74,900

____ \$75,000-\$99,999 ____ \$100,000-\$149,999 ____ Over \$150,000

POST SURVEY (Main Study)

For each of the items below, circle the number that best describes your overall feelings about the NASCAR brand you saw in the videogame.

A very bad brand	1	2	3	4	5	6	7	A very good brand
Very unsatisfactory	1	2	3	4	5	6	7	Very satisfactory
Dislike extremely	1	2	3	4	5	6	7	Like extremely
Very unfavorable	1	2	3	4	5	6	7	Very favorable

How certain are you of the accuracy of the responses you gave in the previous questions regarding your feelings toward the NASCAR brand?

Not confident	1	2	3	4	5	6	7	Confident
Not sure	1	2	3	4	5	6	7	Pretty sure
Uncertain	1	2	3	4	5	6	7	Certain

II. Testing the latency of response (Attitude Accessibility)

First slide



Now we are about to actually record your evaluation about brands and reaction time.

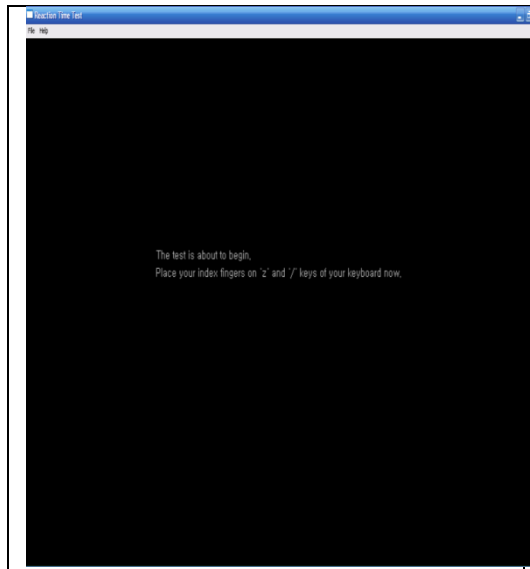
This time, ten brand names will appear on your computer screen.

You need to indicate your overall feelings about the brands by hitting either 'Z' for like or '/' for dislike.

To avoid mistakenly hitting a wrong key, keep one index finger above each of the two keys during the test. Please respond as quickly and accurately as possible.

Click 'SPACE BAR' when you are ready.

Second slide



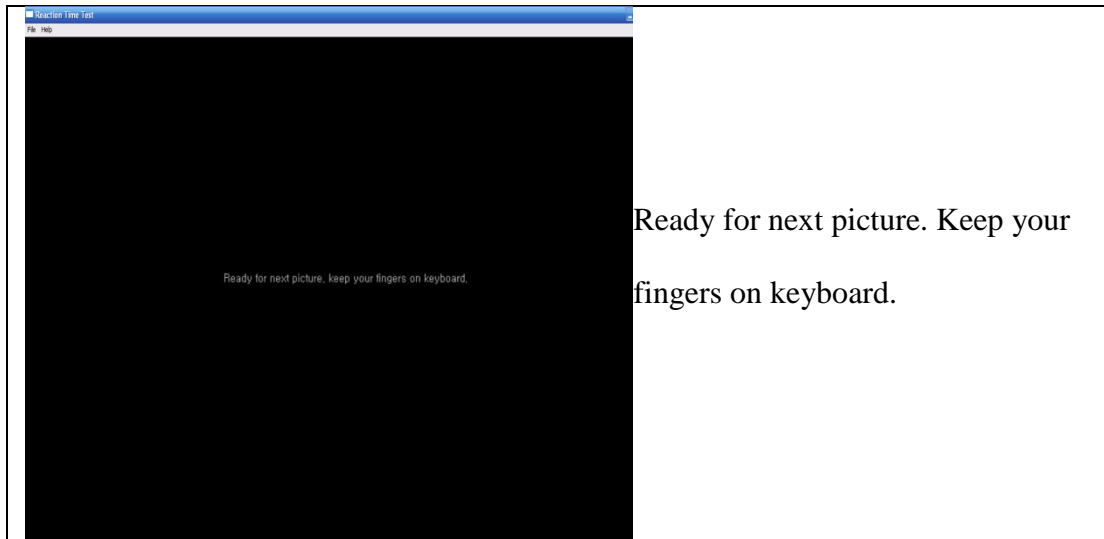
The test is about to begin.

Place your index fingers on 'Z' and '/' keys of your keyboard now.

Third slide



Fourth slide (A three-second interval separated each trial).



Fifth slide



National Football League

This is the end of experiment. Thanks you very much for your cooperation.
In case you have any questions about this experiment, feel free to let the researchers know.

1	5030	ms	Yes
2	300	ms	No
3	17110	ms	No
4	297	ms	Yes
5	281	ms	No
6	297	ms	Yes
7	297	ms	No
8	453	ms	Yes
9	308	ms	No
10	391	ms	No

Last slide: The results of the subject's latency of each response to ten brands.

III. Behavior measure

Direction: Considering you have a chance to select sport products featuring each of the following eight sports (NBA, NASCAR, MLB, NFL, NHL, PGA, FIFA, and NCAA), please rank each sport in order of preference with a number between 0 (least interested) and 7 (most interested) under each brand choice situation.

Sports	Rank
	
	
	
	
	
	
	
	