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## Grinding the Axe Body Spray: linking gamer experience and brand recall in Guitar Hero III

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GRINDING THE AXE BODY SPRAY: LINKING GAMER EXPERIENCE  
AND BRAND RECALL IN GUITAR HERO III

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Master of Mass Communication

in

The Manship School of Mass Communication

by  
Miranda Lemon  
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There comes a time in every budding academic's life when one must admit wrongdoing. I have begrudgingly reached such a point. In April 2007, my brothers, Brady and Cory, brought home a video game called Guitar Hero that, in my opinion, was the dumbest game I had ever seen. One year later, I retract my initial judgments. So first and foremost, I would like to thank my brothers for providing the inspiration for this thesis.

None of my educational endeavors would have been possible without the love and support of my parents, Ron and Diane, who first sent me to "art camp" for my undergraduate education and who have now watched me dedicate two years towards a Master's thesis on video games. Mom and dad, thanks for letting me have fun with my education!

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## ABSTRACT

The growth in popularity of social video games that appeal to a wide variety of audiences offers new opportunities for in-game advertisers to reach beyond the traditional gamer market. The current study aimed to test the effectiveness of in-game advertising placements in the popular video game, *Guitar Hero III*, based on the Limited Capacity Model of Mediated Motivated Message Processing (LC4MP). The Limited Capacity Model predicts that experienced gamers utilize fewer mental resources when playing video games because the repeated action of playing video games eventually becomes automatic. An experienced gamer would therefore have a greater capacity to remember in-game advertisements. The model also predicts that a video game that places a high cognitive demand on gamers leads to a decrease in mental resources available to process the gaming environment. The study included an experiment and a survey as well as BIOPAC equipment to provide physiological measures of heart rate.

Results suggest that gamer experience does not significantly impact brand recall or brand attitude and that significant differences exist between players and watchers. Study results also indicate that the gamer's perception of a brand's fit in the video game significantly influences brand attitude. The study bears important implications for in-game advertisers because the results indicate that in-game advertisers should carefully consider both the content and nature of video games when developing in-game brand applications. The study results also suggest that the LC4MP lacks predictive abilities in terms of in-game ad recall when placed in a gaming context.

## CHAPTER 1 INTRODUCTION

The stereotypical characterization of a dedicated video gamer elicits images of calloused controller thumbs, bloodshot corneas, and pasty skin colored only by the glow of an inviting television. Gamers spend numerous hours engaged in a virtual environment, with boys age 13 to 18 spending up to 18 hours per week playing video games and girls age 13 to 18 playing video games for up to 8 hours per week (Dolliver, 2007). Although video games seemingly serve only a leisure purpose, some researchers believe that regularly playing video games leads to an increased ability to process information when exposed to a stimulus. Current gaming research indicates that playing video games may improve emotional health, motor skills, and visual abilities (Green & Bavelier, 2003; *Video Games*, 2007). Lang's (2005) Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) proposes that people in general have a limited ability to simultaneously encode, store, and retrieve information when performing tasks, but experienced gamers have a greater ability to process information. Repeatedly playing a video game gradually causes the controller motions and hand-eye coordination to become automatic, which demands less thought (Lang, 2005). The LC4MP bears important implications for research in in-game advertising because the model suggests that an experienced gamer engaged in a video game has additional mental resources to apply to processing the game's environment, including in-game advertisements.

The concept of placing brands within video games generally falls into two categories. Advergaming describes an online computer game developed around a brand (Kretchmer, 2004). In-game advertising involves the placement of branded products within a video game environment. Types of brand placements range from billboards integrated into the background of the gaming environment to actual branded products that virtual characters use. Statistics

indicate that in-game advertising spending grew 39% from 2005 to 2006, a figure that illustrates the growing popularity of the medium (Lehman, 2007). The method bears some similarity to product placement in movies and television shows in that logos and branded products appear in the environment of the medium. Product placement research indicates that placement within a movie or television show can have a positive impact on both brand recall and brand attitude, but can have negative effects under conditions of brand overexposure (Gupta & Lord, 1998; Law & Braun, 2000; Matthes, Schemer, & Wirth, 2007). Yet in-game advertising differs from product placement in that gamers actively determine the events of the game rather than passively watch a screen. The Limited Capacity Model therefore applies to a study of in-game advertising because the model considers the distribution of mental resources when playing a video game. Examining how an individual's experience with video gaming affects recall of in-game brands will aid advertisers in determining when to utilize an in-game advertising strategy.

Few researchers have fully examined the effects of video gaming experience on in-game advertisement recall. Schneider and Cornwell (2005), for example, found that a high level of gamer experience leads to a greater likelihood of in-game brand recall and recognition. Lee and Farber (2007), on the other hand, found a negative correlation between gamer experience and brand recall because more experienced gamers focused on actually playing the game. The current study intends to explore this disparity by regarding gamer experience and brand recall through the lens of Lang's (2005) Limited Capacity model. The study will examine the effects of a gamer's level of experience on brand recall in a music genre video game through an experiment. A comparison between the survey results and physiological measures of experienced and inexperienced gamers during and after exposure to the stimulus material will indicate whether gaming experience plays a role in in-game brand recall. The study will also

contribute to theory by testing whether the LC4MP can effectively predict the results of in-game advertising experiments. Results will likely indicate that experienced gamers overall recall more in-game brands than inexperienced gamers because the Limited Capacity model implies that experienced gamers have more mental resources to dedicate to aspects of the gaming experience beyond game play.

The current study aims to fill gaps in current in-game advertising research by introducing a relatively new model to the study of in-game advertising. Previous research involving the Limited Capacity Model mainly examined television news and the effects of certain graphic elements and edits on retaining story content (Lang, A., Zhou, S., Schwartz, N., Bolls, P.D., & Potter, R.F., 2000; Fox, J.R., Lang, A., Chung, Y., Lee, S., Schwartz, N., & Potter, D., 2004). Lang (2005) formulated predictions about the Limited Capacity model's application to video games, but failed to provide empirical evidence. The current study will use the model to frame research on in-game brand recall to contribute to the validation of the model. The research will also utilize the model to determine how a video game's level of difficulty and a gamer's level of experience affect brand recall. The model predicts that a complex video game that requires a great deal of mental resources reduces the likelihood of encoding the stimulus, except for experienced video gamers. Game play actions may become automatic after time (Lang, 2005). Experienced gamers should therefore recall more in-game brands than inexperienced gamers because experienced gamers require less mental resources to play the game. Results will bear important implications for in-game advertisers because the study will provide insight into the effectiveness of in-game advertising. Overall, the study will empirically test a new model's application to in-game advertising to bring a new perspective to the study of in-game advertising



effectiveness and will emphasize how advertisers should carefully consider the variables that may alter in-game advertising recall.

## **CHAPTER 2**

### **LITERATURE REVIEW**

#### **The Limited Capacity Model**

Lang's (2000) Limited Capacity Model of Motivated Mediated Message Processing (LC4MP) will guide the current research. Previous research applications of the Limited Capacity Model have ranged from broadcast news to designing effective messages about health issues. Lang, et al. (1999) applied the model to broadcast news messages to determine how presentation, pacing, message, and the level of arousing content of a message affects attention and recall. The researchers found that news producers should strike a balance between message pacing and arousing content because the mind cannot handle an arousing message with fast pacing because people have a limited ability to process information. Miller (2006) used the Limited Capacity Model to determine how "live" and "breaking" news attract attention differently and found that breaking news gains more attention and improves memory for story content. Niederdeppe, et al. (2007) utilized the LC4MP to test different combinations of audio and visual cancer awareness messages to determine which combination produced the most effective message and found that certain stylistic elements like intense imagery and fast music improved ad recall. All previous studies use the LC4MP as a framework for behavior when watching television without competing stimuli or secondary tasks. The current study aims to expand such research by introducing gaming into the existing body of Limited Capacity Model research.

The Limited Capacity Model assumes that people process information and that people have limited abilities to process information. Some information processing occurs on an automatic basis, while some information processing elicits a controlled response (Lang, 2000). For example, a startling message of fear triggers automatic information processing in the form of a defensive reaction. An individual engages in controlled information processing when specific

stored information requires retrieval, such as remembering directions to a location. The processing of information requires three sub-processes: encoding, storage, and retrieval. Encoding involves the transferring of a message from the environment to the brain (Lang, 2000). An individual gleans bits of information from the encoded message to transform into mental representations. Lang (2005) predicts that motivationally salient, structurally salient, and personally salient messages will most likely undergo the encoding process. Salient items include food, novelty items, and items that bear personal relevance (Lang, 2005).

According to Sherif and Sherif (1969), individuals undergo psychological screening to narrow potential sources of relevant stimulation at a particular time. Encoding only relevant stimuli allows an individual to process several stimuli at one time. External factors that contribute to selectivity include intensity, size, repetition, contrast, and movement (Sherif & Sherif, 1969). Sherif and Sherif (1969) assert that internal factors also determine the personal salience of a message. Personal involvement with a particular brand or product may increase the likelihood of viewing and remembering an in-game advertisement. In terms of video games, individuals may remember more in-game brands for habitually purchased products or for products that appeal to the individual's lifestyle.

Once an individual encodes a message, the information reaches the storage stage. Individuals link newly stored information with old information to make the retrieval of stored representations easier (Lang, 2000). An in-game advertisement for a product that an individual already uses will therefore reach the storage process because the individual retains previously stored information about the product. When stored information requires retrieval, the individual allocates mental resources to searching previously constructed information links (Lang, 2005). The three sub-processes occur simultaneously under exposure to a stimulus (Lang, 2000).

The Limited Capacity Model also makes assumptions about the effects of a gamer's level of experience on mental resource allocation. Controller configurations and patterns within games repeat and eventually transform into automatic processes. An automatic process demands fewer mental resources (Lang, 2005). An experienced gamer who knows the controller configurations would therefore dedicate less mental resources to physically controlling the game and would have the ability to dedicate more mental resources to the actual game environment. An inexperienced gamer would have to dedicate mental resources to learning the controller configurations and to the game environment. Experienced gamers would therefore exhibit higher levels of brand recall than inexperienced gamers because the experienced gamers dedicate fewer mental resources to learning the controller configuration of the game and may dedicate more mental resources to the actual events of the game.

An individual encodes, stores, and retrieves information as a means of processing information. Information processing requires a certain amount of mental resources, depending on the stimulus. When exposed to a stimulus that requires a large number of mental resources, the individual may experience cognitive overload. Lang (2005) indicates that cognitive overload occurs when information processing requires more mental resources than available. Under a condition of cognitive overload, information processing suffers because the individual loses the ability to adequately perform each sub-process simultaneously (Lang, 2005). In terms of video games, cognitive overload may occur when a gamer plays a video game with a complex controller configuration while attempting to pay attention to the events of the game. On the contrary, an overly simple stimulus leads to boredom (Lang, 2005). Lang (2005) posits that novice gamers have a greater likelihood of experiencing cognitive overload than experienced gamers. Gamers who experience cognitive overload may not enjoy the gaming experience. The

experienced gamer retrieves previously stored information about gaming while playing a video game to aid in the processing of the stimuli (Lang, 2005).

## **Brand Recall**

To most effectively test the effects of gamer experience and cognitive load in terms of the Limited Capacity Model, the current research will use brand recall as a primary dependent variable. The study must first operationalize brand recall by reviewing existing research in brand recall. Clow and Baack (2005) define brand recall as a test of whether individuals can remember information about ads viewed in a particular time period. Aided brand recall provides the subject with a cue about the brand, while unaided recall relies on the consumer's memory alone to remember information about previously viewed brands (Clow & Baack, 2005). The current study will use both aided and unaided brand recall to test the effectiveness of in-game advertisements.

Research in brand recall focuses on a variety of topics. Johnson and Russo (1978) used an experiment to test the effects of ad type, product type, and cue type (brand name or the name of a product attribute) on brand recall by showing different ads for air conditioners and cooking oil to subjects ( $N = 20$ ). Results indicated that ads that emphasize different aspects of a brand or product affect recall differently. For example, attribute-based advertisements led to faster recall of product attributes, while ads that emphasized brands led to faster brand recall. Recall also differed between product types because the product relevance of air conditioners or cooking oil varies among individuals (Johnson & Russo, 1978). Hutchinson (1983) affirms the significant effect of product relevance on brand recall. In a study of product expertise and free recall, the researcher tested the differences in free recall of non-prescription cold medicines among pharmacy students and marketing students ( $N = 71$ ). Pharmacy students recalled more brands

because they used their expertise to create mental connections based on different ingredients in different brands. Prior knowledge can affect brand recall because exposure to relevant brands creates stronger mental associations (Hutchinson, 1983).

Costley and Brucks (1992) compared the recall and preference of copy-based and picture-based ads for products with similar attributes. Participants ( $N = 387$ ) viewed an ad for one brand and were asked to rate the physical design elements of the ad while discouraging brand evaluations. The participants then viewed an ad for another brand of a similar nature 24 hours later and were asked to rate the brand itself. Results indicated that the perception of one brand affected the preference for the other brand in that a higher preference for one brand led to a lower preference for the other brand. Although participants remembered information about ads with pictures better, the participants were not likely to use information pictured in ads to rate preferences (Costley & Brucks, 1992). Habitually purchasing or interacting with a certain product may also aid in brand recall, further emphasizing the assertion that personally relevant products enhance brand recall (Bogart & Lehman, 1973). A study involving unaided brand recall asked female heads of households ( $N = 400$ ) to list household product brand names. Results indicated that the most heavily purchased and most heavily advertised products enjoyed the highest unaided recall levels. The results of the studies support the Limited Capacity Model, which predicts that product relevance or salience will increase the likelihood of information storage. Video gamers would therefore exhibit a higher level of in-game brand recall for personally relevant products.

Competing ads and product liking may also influence an individual's long-term brand recall. Keller (1987) confirms that competing ads inhibit brand recall. Subjects in the study ( $N = 200$ ) viewed both favorable and unfavorable advertisements for a variety of products and

provided both memory and evaluation measures. Results show that viewing many advertisements at the same time reduces the strength of the link between brand name and advertisement in memory (Keller, 1987). A gaming environment that features a variety of ads may therefore not exhibit the same success with ad recall as a gaming environment with few ads. Brand familiarity may strengthen the effect of competing advertisements in an environment. Kent and Allen (1994) conducted a study that compared recall of familiar and unfamiliar brands in environments with advertisements for competing familiar and unfamiliar brands. Results suggested that brand familiarity significantly improved brand recall. Exposure to both familiar and unfamiliar competitive brands created confusion in participants (N = 84) when asked to recall products (Kent & Allen, 1994). Brand familiarity would therefore benefit a product in a virtual advertising environment because other ads generally compete for attention in games with in-game ads.

In addition to personal relevance, product salience, or how recently an individual has seen a product or ad, can also affect how well an individual recalls a brand. Alba and Chattopadhyay (1986) conducted several experiments that manipulated product type and the amount of time between exposure to an ad and recall. The first experiment exposed subjects (N = 64) to one of four brands. Researchers asked subjects in the high salience condition to concentrate on the brand for one minute. The subjects then listed all brands in the product category for the brand that they had studied. The first experiment supported the hypothesis that product salience increased brand recall. Subsequent experiments manipulated both the product category and the amount of time between exposure to the brand and brand recall (N = 175). The researchers ultimately concluded that salience plays a role in brand recall (Alba & Chattopadhyay, 1986). Product or brand salience could therefore affect brand recall in a video

game environment because if an individual sees an ad for a product located in the game, the individual will be more likely to form stronger associations in memory.

### **In-Game Advertising**

Existing research on in-game advertising generally tests the same variables as research in traditional advertising media. Variables like brand recall, brand liking, and purchase intent contribute to determining the overall effectiveness of in-game advertising. Nelson (2002) examined the effectiveness of brand placement within a racing video game in terms of short-term and long-term brand recall. Short-term brand recall would require only weak links to stored information to elicit brand memory, while long-term brand recall would require strong mental links to recall a brand. In the first study, participants (N = 20) played a racing game either alone or in a group and completed a survey that asked about attitudes towards product placement and brand recall both immediately after the stimulus material and 5 months later. The racing game mainly contained ads for cars and car-related products, such as motor oil. The results of the first study revealed that gamers could accurately recall the brands within the game immediately after playing, but brand recall decreased after the 5-month period. Brand recall likely decreased because the product salience decreased over time. The researcher did not, however, account for brand relevance in the study. Young college students, who may not have had much experience with car-related products, composed the sample. Had the study incorporated product relevance as a variable, the researcher may have located the reason for a decrease in brand recall.

In the second study by Nelson (2002), participants (N = 16) played a computer game that the researcher altered to incorporate both local and national ads. Participants completed a survey that asked for brand recall and attitudes towards in-game ads. Results showed strong support for a link between product relevance and brand recall. As emphasized in the Limited Capacity



Model, personally relevant or salient products have a greater likelihood of undergoing encoding and storage. Personally relevant products may lead to greater recall because individuals can link past experiences with a product to current exposures, which creates stronger mental links. The current study must therefore consider product relevance and salience as important variables in testing brand recall.

An additional consideration in Nelson's (2002) research included the manipulation of gamers and game watchers. Subjects played the stimulus video game alone or in a group to mimic each subject's typical gaming setting. Yet the researcher did not consider the differences between players and watchers in brand recall and brand attitude when analyzing the study data. In a later study, Nelson, Yaros, and Keum (2006) analyzed the differences between players and watchers in a gaming situation ( $N = 64$ ). The results indicated that both players and watchers exhibited an equivalent level of brand recall. Players and watchers also experienced similar perceived persuasion effects (Nelson, Yaros, & Keum, 2006). The research reveals little difference between players and watchers in terms of in-game advertising. Such information bodes well for in-game advertisers because people generally classify video games as a social activity. The effects of in-game advertising could therefore extend beyond the actual video gamer and influence spectators.

H1: Video game players and spectators will exhibit a similar level of brand recall.

H2: Video game players and spectators will exhibit a similar level of persuasion.

Brand placements in video games may also have an effect on the type of memory engaged in recall. Yang, Roskos-Ewoldsen, Dinu, and Arpan (2006) measured the effects of brand placement on implicit, or unconscious, memory and explicit, or conscious, memory. Participants in the experiment ( $N = 153$ ) played either a racing game or a soccer game with in-

game advertisements and then performed either an implicit or explicit memory test. The implicit memory test asked the subjects to fill in missing words in brand names that appeared in the games, while the explicit memory test asked subjects to recall brands through a recognition test. Results show that participants exhibited a higher level of implicit memory brand recall than explicit memory. Subjects also remembered more brands from the games they played than from the games they did not play (Yang, et al., 2006). The researchers concluded that although subjects did not exhibit a high level of explicit brand recognition, in-game brand placements may have an effect on implicit memory. Implicit memory may influence future purchase decisions (Yang, et al., 2006). The researchers did not, however, take into account the fact that the subjects may have already known the name of the brands that appeared in the video games. Although the results of the study indicate that exposure to the in-game advertisement increased the likelihood of implicit brand recall, many participants may have simply been able to complete the implicit memory word-fragment test by logically filling in letters that created words. The brand's relevance to each individual may have also influenced results, a factor that emphasizes how product relevance affects brand recall.

H3: Subjects will remember more brands for personally relevant or familiar products.

H4: Subjects will recall more in-game advertisements for salient products.

Chaney, Lin, and Chaney (2004) also measured gamer memory of in-game advertisements by manipulating a computer game to incorporate billboards for three different product categories: pizza, soda, and digital cameras. Players (N = 42) took a survey that tested brand recall. Half of the sample could not recall products or brands from the billboards in the game (Chaney, Lin, & Chaney, 2004). The researchers attributed the lack of memory to the use of a highly complex game as stimulus material. The study also found that players did not believe

that the inclusion of billboards enhanced game play (Chaney, Lin, & Chaney, 2004). The complexity of the game likely hindered mental resource allocation to encoding because participants dedicated more mental resources to learning controller configurations or to determining the objectives of the game. Participants may have exhausted the pool of mental resources. The individuals also may not have gauged the advertisements for the products as personally or motivationally salient, a factor that could have decreased brand recall. The study did not take into account the experiment participants' level of experience with gaming, a variable that could have revealed how drastically the complex game affected both experienced and inexperienced gamers. The current study will therefore account for game complexity in terms of the Limited Capacity Model.

H5: Subjects in the high cognitive load game condition will recall fewer in-game brands than subjects in a low cognitive load game.

Researchers can also determine cognitive load through physiological measures. Physiological reactions can provide insight into internal processes and can validate or refute self-reported measures. Physiological reactions also provide a universal measurement for individuals, so confounding variables like question order effects generally do not affect the outcome of the research (Klebbba, 1985). Lang (2000) asserts that a combination of physiological and self-reported measures may indicate the thoroughness of information processing in the mind. Since cognitive load bears a great deal of significance in the workings of the LC4MP, the current study utilizes heart rate as a physiological variable. Research in cardiovascular responses by Lacey & Lacey (1970) indicates that in a condition that requires an individual to pay attention to a specific task, heart rate decreases. Heart rate also decreases in preparation for a stimulus. Tasks that require processing like problem-solving or that involve additional external stimuli

lead to an increase in heart rate (Lacey & Lacey, 1970). The use of heart rate in the study therefore provides insight into the type of psychophysiological reaction subjects undergo during stimulus exposure.

Ivory and Kalyanaraman (2007) utilized physiological measures in a study of the effects of technological advancement and violent content on gamers. Skin conductance levels, used to measure arousal, indicated that advancements in gaming technology led gamers ( $N = 120$ ) to experience an increased level of arousal when engaged in a video game (Ivory & Kalyanaraman, 2007). Bolls, Lang, and Potter (2001) used physiological measures to determine how individuals reacted to various positive and negative radio advertisements. The researchers used a combination of facial muscle movements and heart rate to determine emotion. Skin conductance measured arousal. The researchers also used heart rate to determine how many resources each subject ( $N = 41$ ) allocated to the radio messages. Results indicated that an increase in concentration led to a decrease in heart rate (Bolls, Lang, & Potter, 2001). Additionally, Grabe, Lang, Shuhua, and Bolls (2000) used heart rate as a measure of concentration in testing the differences between educated and uneducated individuals ( $N = 40$ ) when watching the news. Results indicated that more educated people experienced a decrease in heart rate while watching the news because educated individuals likely pay closer attention to the news (Grabe, et al., 2000). The LC4MP The current study will therefore use heart rate as an indicator of the level of concentration, or the cognitive load a video game places on an individual's mind, while engaged in a video game.

H6: Subjects in a high cognitive load condition will concentrate more than subjects in a low cognitive load condition.

H7: Players will concentrate more than watchers during stimulus exposure.

H8: Inexperienced video game players will concentrate more on the video game than experienced players.

Schneider and Cornwell (2005) examined short-term recall and recognition of in-game brand placements according to the prominence of the ads and a gamer's level of experience with video games. The researchers analyzed a level of a racing game and labeled advertisements as low, medium, or high prominence and discarded the medium advertisements. Participants (N = 46) took a pre-measure questionnaire to obtain demographic information and to determine the gamer's level of experience. Participants then completed five laps of the racing game with ads and immediately completed a survey at the end of the gaming session. The survey asked for brand recall, descriptions of in-game ads, and whether or not the participant entered a state of flow, or ease with the game that leads to enjoyment. Schneider and Cornwell (2005) hypothesized that greater in-game brand prominence would lead to greater brand recall and that expert gamers would recall more in-game brands than novice gamers. The results supported both hypotheses. The study did not, however, measure variables like brand relevance and advertisement preference that may have influenced brand recall. Yet in another study by Park, Bradley, and Kim (2003), the researchers found that in a shooting game, an ad's placement closer to the main focal point of the game led to better recall. Although the study did not account for gamer experience, the results suggest that gamers (N = 41) have a limited ability to view information far beyond the focal point of the game. Such a factor lends support to the assertion that prominently placed brands will elicit higher recall.

Lee and Faber (2007) also conducted a study that involved a racing game with both prominent and peripherally placed billboards incorporated into the environment. In the study, participants (N = 155) played the racing game in one of 12 conditions and completed a post-

survey that asked for information like degree of gaming experience and recognition of brand names. The billboards in the game advertised gasoline, deodorant, and pet food. The variety of product categories provided products that fit both coherently and incoherently into the game. The researchers hypothesized that subjects would remember both prominently placed billboards and incongruent brands because both factors “stick out” in memory. The research supported the hypothesis that subjects remember prominently placed ads better than peripheral ads, which mirrors Schneider and Cornwell’s (2005) research. Results also showed that subjects recalled more incongruent brands that did not mesh with the subject of the game. Such information indicates that subjects will remember more unexpected or incongruent brands in games because the brands “stick out” more in memory. Yet at the same time, a brand that does not fit in a particular game may suffer negative effects, such as a negative brand attitude (Lee & Faber, 2007).

Lee and Faber (2007) also hypothesized that experienced gamers would better recognize prominent brands and that a greater gap would exist between recognition of prominent brands and recognition of peripheral brands in inexperienced gamers rather than experienced gamers. Inexperienced gamers did not recognize peripheral brands as well as focal brands because they likely dedicated more mental resources to playing the game. Contrary to Lang’s (2005) Limited Capacity Model, however, experienced gamers also did not recognize many peripheral brands. The researchers assume that experienced gamers put full attention on the game and lacked sufficient secondary resources. Such results may have stemmed from the fact that the experienced gamers may have had gaming experience on console platforms, but not on the PC platform that the researchers used for the experiment. Additional explanations stem from the fact that none of the subjects had played the experimental game before and therefore were not

familiar with the game layout or controls. The current research will therefore utilize a video game that many gamers should have previously played in order to account for confounding variables. The following hypotheses reflect the effects of gamer experience, brand prominence, and brand congruence on brand recall.

H9: Experienced gamers will remember more in-game brands than inexperienced gamers.

H10: Subjects will remember more incongruent in-game brands than brands that reflect the subject of the game.

As in-game advertising grows in popularity, advertisers must cautiously consider the effects of advertising in a new medium. In-game applications of advertising have received mixed reviews from gamers to the extent that research should consider gamer attitudes when evaluating in-game advertising. A netnography, or ethnography on the Internet, by Nelson, Keum, and Yaros (2004) reveals a wide variety of opinions regarding in-game advertising. The study results indicate the existence of a schism among gamers in that some gamers harbor a very cynical viewpoint toward in-game advertising, while some gamers accept in-game ads. Many of the cynical gamers believe that the overcommercialized environment should not extend into video games (Nelson, Keum, & Yaros, 2004). In-game advertising could therefore lead gamers to develop negative attitudes toward particular embedded brands.

Additional concerns about gamer attitudes towards in-game brands stems from the application of the brands in the gaming environment. Lewis (2006) conducted an experiment that exposed one group of subjects to a game with in-game ads, and one group to a game without ads (N = 100). Overall, the results indicated that the in-game advertising led to high awareness, but only to the extent that the ads contribute to the realism of the game. Subjects felt a reduced sense of realism and a sense of annoyance towards in-game ads that did not belong in the game.

Although Lee and Faber's (2007) research indicated that subjects better recalled incongruent brands, Lewis (2006) supports the assertion that incongruence in in-game branding can threaten brand attitude. Research must therefore carefully consider subjects' attitudes towards in-game advertisements because negative perceptions may lead to negative brand attitudes.

H11: Subjects will exhibit negative attitudes towards incongruent in-game ads.

RQ1: How does exposure to in-game brands through a video game affect the intent to purchase in-game brands?

RQ2: How does game liking affect brand attitude?



## CHAPTER 3 METHOD

Existing studies of in-game advertising indicate that a myriad of variables affect a gamer's recall of in-game ads and attitude towards in-game ads. Gaps in research occur in the testing of a gamer's level of experience with video games on elements like brand recall and brand attitude. Lang's (2005) Limited Capacity Model assumes that experienced gamers have a greater ability to allocate mental resources to gaming tasks and gaming events because habitually pressing controller buttons eventually becomes automatic. To test the model's implications, the current study utilized a 2 x 4 factorial experiment design and monitored heart rate through BIOPAC equipment during stimulus exposure to determine how cognitive load, gamer experience, and whether the subject played or watched the game influenced the effectiveness of in-game advertising in a particular video game. Dependent variables included brand recall, brand recognition, brand relevance, intent to purchase in-game brands, and brand attitude. An experiment allowed manipulation of the independent variable while monitoring changes in the dependent variables. *Guitar Hero III: Legends of Rock*, a music genre video game for the Xbox 360 console, served as the stimulus material for the experiment.

### **Stimulus Material**

The October 2007 release of *Guitar Hero III* marks the third installment of the multi-platform game series that has sold over 6 million units since the release of the original single-platform *Guitar Hero* in 2005 (Bulik, 2007). *Guitar Hero III* generated sales of 1.4 million units in the first six days after the game's release and continues to experience high demand from consumers (Ault, 2007; Bruno, 2007). The "T" for Teen-rated music genre game adds to the growing segment of "casual games" that enjoy mass appeal and require little to no practice or training to play (Bruno, 2007). Inexperienced gamers will likely find the game challenging, but

not to the point of frustration. Conversely, the game should provide experienced gamers with enough of a challenge to avoid boredom, a problem previously cited in Schneider and Cornwell's (2005) study of gamer experience and inexperience. Additionally, the game features a variety of in-game brand placements for companies like Pontiac, Red Bull, Gibson, and Axe Body Spray (*Partners*, 2007). *Guitar Hero III*'s combination of ad-rich environments, simple game play, and popularity in the market qualify the game as ideal stimulus material for testing the effects of gamer inexperience and experience on in-game brand recall.

*Guitar Hero III* offers a challenge of hand-eye coordination set against the backdrop of a band's rise to fame, a concept that has received excellent reviews from a variety of gamers (*Guitar Hero III*, 2007). The game replaces the conventional console controller with a wireless Gibson Les Paul guitar controller that has 5 buttons on the neck, along with a "strumbar" on the body for strumming notes like an actual guitar (*Xbox 360 Les Paul Controller*, 2007). Game play features a scrolling guitar neck that displays patterns of color-coded "notes" that appear in time with music (Boyer & Tsao, 2007). Players press the corresponding colored button on the guitar controller while "strumming" the strumbar to successfully play the note. Gamers play through 73 classic and current rock n' roll songs on four difficulty levels: easy, medium, hard, and expert (*Battle of the Bands*, 2007). Players must advance through 8 sets of 5 songs of increasing difficulty to advance the band's "career" within each level of difficulty to complete the game (*Guitar Hero III: Career Mode*, 2007). The game's simple yet challenging structure provides a myriad of primary and secondary tasks on which to test the Limited Capacity model.

Although the original *Guitar Hero* only appeared on the Playstation 2 console, experiment participants played *Guitar Hero III* on Microsoft's Xbox 360 console because the console offers up-to-date technology and has a significant presence in the console market.

Lifetime sales of the 2005-released Xbox 360 reached 10.51 million units in 2007 (Mutschler, 2007). Regardless, the *Guitar Hero III* game interface, content, and controller do not change on different consoles, so the choice of console did not affect the structure of the experiment.

## **Experiment**

The independent variables for the experiment include a level of gaming experience, level of cognitive load, and playing or watching the game. Each participant will report experience or inexperience with video games both before the experiment and in the survey following exposure to the stimulus material to confirm the self-reported variable. The determination of cognitive load references Lang's (2000) definition, which describes cognitive load as the number of mental resources required to fully process a message. According to the Limited Capacity model, a stimulus with a high cognitive load decreases the likelihood of encoding, while a stimulus with a low cognitive load increases the likelihood of encoding because an individual can devote mental resources not used in the primary task to other tasks (Lang, 2000). In terms of *Guitar Hero III*, songs of a higher difficulty will likely place a higher cognitive load on an individual's encoding abilities. To manipulate cognitive load, the experiment sessions alternated between the easiest song in the game and one of the hardest songs in the game. The experiment moderator pre-assigned each session to either the high or low cognitive condition.

The 2 x 4 experimental design enabled comparisons between experienced and inexperienced players, degree of cognitive load, and playing the game or watching the game to determine how different manipulations affect elements like brand recall. The experiment therefore required 8 conditions: low experience x low cognitive load x watch, low experience x high cognitive load x watch, high experience x low cognitive load x watch, high experience x high cognitive load x watch, low experience x low cognitive load x play, low experience x high

cognitive load x play, high experience x low cognitive load x play, and high experience x high cognitive load x play (see Table 3.1). Ideally, 25 subjects would participate in each condition.

**Table 3.1**  
**2 x 4 Factorial Experiment Design**

	Low Cognitive Load	High Cognitive Load	Playing	Watching
High Experience	25	25	25	25
Low Experience	25	25	25	25

To accurately measure the effects of a gamer's level of experience on elements like brand recall and to expand on existing research in the field, the current study incorporated an experiment and a survey. A convenience sample of undergraduate students from an introductory mass communication class, an upper level mass media law class, and an upper level media research class at Louisiana State University served as subjects for the study. Subjects were not excluded on the basis of gender, gaming experience, or experience with the *Guitar Hero III* game specifically because the structure of the experiment required a variety of subjects. Each experiment session involved 1 to 4 subjects. One player played a pre-selected song in *Guitar Hero III*, while all other subjects watched the game. One to three additional subjects participated in the experiment as spectators to the stimulus material to most closely replicate a natural gaming situation because as a casual game, *Guitar Hero III* attracts groups of gamers.

To maintain consistency across exposures, the researcher developed a pre-determined group of settings. Each subject played as Axel Steel, a male character dressed in blue jeans and a t-shirt, because the character's features provided little distraction from the game. All experiment participants played *Guitar Hero III* on the medium level of difficulty, ensuring that inexperienced players had the ability to play with the game's pace without sacrificing the level of difficulty for experienced players. Within each level of difficulty, individual songs increase in difficulty as the player completes songs (*Guitar Hero III Setlist Revealed*, 2007). The first song on the medium level therefore exhibits the lowest level of difficulty, while the last song exhibits the highest level of difficulty. As the song difficulty increases, cognitive demands should increase because the game patterns become increasingly complex. The first song on the medium level, "Slow Ride" by Foghat, therefore served as the song with the lowest cognitive load. One of the last songs on the medium level, "The Number of the Beast," by Iron Maiden, served as the song with the highest cognitive load.

The *Guitar Hero III* game also allows the manipulation of the background in which a gamer plays a song. The researcher chose to require all subjects to play in the "Video Shoot" background, which features the band on a Pontiac Garage-sponsored truck. The background also includes several other branded products: Line 6 amps, Mackie floor monitors, and Zildjian drums. To increase the richness of the in-game ad environment, each player's character performed songs on the Axe® Body Spray guitar, a guitar that players "purchase" after earning money within the game by playing songs in different virtual venues. The Gibson Les Paul game controller added another brand to the gaming experience, as the controller features a Gibson logo. In the game setting, the Pontiac Garage logo appeared above the performing band and in several other locations. The Axe Body Spray logo appeared on the main character's guitar.

Additionally, players directly interacted with a branded product by using a Gibson controller. In total, the experimental condition included 6 different brands in various locations.

Additionally, the study incorporated the use of BIOPAC equipment to measure heart rate throughout the experiment. Although some researchers criticize the method, physiological measures can provide insight into cognitive processes beyond self-report and can add depth to advertising research (Klebbba, 1985; Stewart, 1984). Past research has utilized heart rate as an indicator of the degree of concentration required of a stimulus or as an indicator of the presence of an orienting response, or an inner response to new information in a stimulus (Lang, 2000; Bolls, Lang, & Potter, 2001). The current study therefore utilized heart rate as an indicator of the degree of concentration each subject experienced while playing or watching *Guitar Hero III*. The use of BIOPAC equipment poses minimal physical risk to experiment participants.

## **Procedure**

The researcher recruited subjects from an introductory mass communication class and from three upper-level, non-advertising mass communication classes at Louisiana State University. Participating subjects received extra credit for their class and were not penalized if they declined participation.

Before the subject entered the experimental situation, the researcher placed the appropriate settings on the game to ensure consistency across individual exposures. The researcher randomly assigned the high cognitive load or low cognitive load condition and an experiment number to each session. Upon arrival, the subjects were first orally briefed on the experiment procedures and were informed of any risks associated with the BIOPAC equipment. Subjects who agreed to participate in the study completed a consent form with a false study title and study description to preserve the true nature of the experiment. The experiment moderator

provided those subjects who had never played the *Guitar Hero III* video game with written instructions on how to play the game and instructed participants only to play in the pre-determined settings.

The researcher next prepared participants for connection to the BIOPAC equipment. The experiment moderator lightly brushed a mildly abrasive pad over contact areas to remove dead skin cells and other matter that may have inhibited electrode contact with skin. Contact areas included the inside of the left wrist and the inner side of the left and right ankles. The researcher placed an adhesive pad on each contact area to connect the electrode to the individual. The electrodes have small clamps that attach to a raised piece of the adhesive pads. The subjects experienced little to no physical pain, as the adhesive pads resemble small bandages.

Once all subjects were connected to the BIOPAC equipment, the researcher allowed the player some time to adjust the guitar controller to ensure comfortable game play. The researcher also allowed players to stand or sit while playing the song according to individual preferences. The experiment moderator also noted that if the subjects missed too many notes and failed a song during game play, the player should restart the song. Ivory and Kalyanaraman (2007) used a similar strategy to account for skill differences in gaming. To account for time discrepancies, the experiment moderator timed each session to ensure that each participant played the game for the same amount of time, regardless of the number of failures.

Once the subjects settled, the experiment moderator started the BIOPAC recording and let the recording run for 20 seconds without activity to record baseline heart rates. At the 20-second mark, the researcher instructed the player to begin the game. Subjects who played “Slow Ride” played the game for the duration of the song, approximately four minutes and forty-five

seconds, or for five minutes if failure occurred. Subjects who played “The Number of the Beast” played the game for four minutes and fifty seconds, or for five minutes.

Upon completion of the song, the researcher disconnected all leads from all electrodes and instructed all participants to remove and dispose of the electrodes. The researcher then assigned participants to specific computers based on whether the subjects played or watched and the subject’s position on the BIOPAC equipment. The specific assignments served to link heart rate data and surveys for the purpose of determining gamer experience and ad recall during the data collection phase. Each participant completed an online survey. The researcher then debriefed subjects on the true purpose of the experiment and asked for questions. The moderator thanked each subject for participating.

### **Post-Experiment Survey**

The post-experiment survey began with demographic questions that determined video game experience and *Guitar Hero III* experience. Such questions from Lewis (2006) asked, “How long have you been playing video games,” “How often do you play video games,” “How many hours do you spend per week playing video games.” An open-ended question asking, “What gaming consoles (if any) do you own?” provided insight into each subject’s experience with video games. The Guitar Hero questions asked, “Rate your level of experience with *Guitar Hero III*,” “Were you familiar with the Guitar Hero song played during the experiment,” and asked subjects to rate their level of experience on a scale from “No Experience” to “Expert” with 4 “real” instruments: guitar, bass guitar, drums, and keyboard. The set of questions allowed the researcher to gauge whether experience with the Guitar Hero video game, familiarity with the song played during the session, or familiarity with an actual instrument influenced results.



The remainder of the survey included questions pertaining to attitude towards advertising, attitude towards in-game advertising, game liking, brand recall, brand relevance, and purchase intent. Each question incorporated the use of 7-point Likert scales from “Strongly Agree” to “Strongly Disagree.” Attitude towards advertising statements from Lewis (2006) included the following: “Advertising in general is annoying/obtrusive to me,” “Advertising/product placement in movies is annoying/obtrusive to me,” “Advertising/product placement in TV shows is annoying/obtrusive to me,” “Advertising provides me with valuable information,” and “I enjoy advertisements for products that pertain to me.” Attitude towards in-game advertising questions, also from Lewis (2006), asked subjects to rate the following statements on a 7-point Likert scale: “Advertising/product placement in video games is annoying/obtrusive to me,” “I hate seeing brand name products in games if they are placed for commercial purposes,” “I do not mind seeing brand name products in games as long as they are not unrealistically shown,” “The presence of brand name products in a game makes it more realistic,” “I generally prefer games that do not have product placement in them to those that do,” “I don’t mind if brand name products appear in games,” “I would welcome advertising in video games if the retail price dropped by \$10 because of advertising included in the game,” “I would welcome advertising in video games if the retail price dropped by \$20 because of advertising included in the game,” “I would pay more for an advertising-free version of a video game that I was interested in,” and “Product placements in games make me want to buy the products.” Such questions provided insight into each subject’s view of advertising in general and each subject’s attitude towards in-game advertising, two factors that may influence responses to an in-game advertising study.

Brand recall allowed the researcher to determine whether gaming experience and cognitive load affects how well gamers remember in-game brands. The survey included both

open-ended, unaided recall of in-game brands and aided recall. Aided recall questions simply asked whether or not the subject saw particular brands in the gaming experience. The questions included both brands that appeared in the game and brands in similar product categories that did not appear in the game. Asking both unaided and aided brand recall and incorporating brands not found in the game allowed the researcher to determine whether subjects actually remembered brands from the game or whether subjects simply guessed.

After the brand recall questions, the post-experiment survey asked a series of the same questions about each brand found in the game. The brands included Pontiac Garage, Line 6, Mackie, Axe, Zildjian, and Gibson. The first question asked subjects to identify the product category of the brand to determine general familiarity with the brand. Subjects were then asked to rate how well the brand belonged in *Guitar Hero* on a 7-point Likert scale from “Strongly Disagree” to “Strongly Agree.” Subjects then answered whether they had seen an advertisement for the particular brand in a certain time period to determine brand salience. Two additional questions asked, “How interested are you in [the brand]?” and “How likely are you to purchase [the brand] in the near future?” to determine each subject’s interest and involvement with the brand. Another set of questions asked participants to rate particular brands on a 7-point Likert scale from “Uncool” to “Cool” and from “Unappealing” to “Appealing” based on scales developed by Spears and Singh (2007). Finally, three questions about each brand’s fit within *Guitar Hero* determined each subject’s perception of each brand’s congruence within the game. Subjects rated each of the following statements on a 7-point Likert scale: “The [brand] fits the *Guitar Hero III* lifestyle,” “I believe that musicians use [brand] products,” and “I feel more positively about [brand] after seeing it in *Guitar Hero III*.”

The survey ended with two open-ended questions to gain a general perspective of subjects' perceptions of why they did or did not remember brands from the game and to judge how subjects perceived the game overall. The question of why subjects did or did not remember brands provided insight into the thought processes of participants while they watched or played the game. The question regarding the perception of the game allowed participants to state more specific opinions about the game. Such opinions could provide insight into the reasons behind the popularity of the game and could provide insight into future games of a similar nature.

To provide a grounds for comparison, a control group of 88 participants completed a survey with the same questions, but excluded the questions about the Guitar Hero gaming experience. To gain control group participants, the researcher posted the survey link on the social networking site, Facebook, and kept the link open until the desired number of participants completed the survey. The control group allowed the researcher to determine whether playing the Guitar Hero game affected dependent variables like brand attitude and purchase intent for the brands that appeared in the video game.

## CHAPTER 4 RESULTS

### Results of Hypothesis Testing

The experiment ( $N = 210$ ) included 95 males (45%) and 115 females (55%). One hundred seventy-one individuals (81%) in the sample fell within the 18 to 24 age group. Overall, 118 (56%) reported having nine or more years of experience playing video games, meaning almost half of the sample had extensive exposure to gaming. Yet only 64 subjects (30%) reported playing video games three to five times a week or more. Additionally, 87 participants (41%) reported playing video games only one to five hours a week. In summary, while most subjects in the study reported many years of gaming experience, few of the subjects actually play video games on a regular basis.

Hypothesis 1 predicted that video game players and spectators would exhibit similar levels of brand recall. A 2 x 2 Chi-Square that linked the aided recall of players and watchers for each brand revealed no significant differences in recall between the two groups (see Table 4.1). Another 2 x 2 Chi-Square compared players and watchers with regards to unaided recall, but also did not reveal significant differences (see Table 4.2). Hypothesis 1 therefore receives support because no significant differences in both aided and unaided recall existed between video game players and watchers.

**Table 4.1**  
**Players vs. Watchers Aided Recall Frequencies**

Brand	Players		Watchers	
	Yes	No	Yes	No
Axe	10 (16.9%)	49 (83.1%)	17 (27.4%)	45 (72.6%)
Gibson	39 (66.1%)	20 (33.9%)	31 (50%)	31 (50%)
Line	17 (28.8%)	41 (69.5%)	13 (21%)	47 (75.8%)
Mackie	5 (8.5%)	52 (88.1%)	11 (17.7%)	51 (82.3%)
Pontiac	15 (25.4%)	43 (72.9%)	15 (24.2%)	47 (75.8%)
Zildijan	20 (33.9%)	39 (66.1%)	22 (35.5%)	40 (64.5%)

**Table 4.2**  
**Players vs. Watchers Unaided Recall Frequencies**

Brand	Players		Watchers	
	Yes	No	Yes	No
Axe	4 (6.7%)	56 (93.3%)	5 (8.1%)	57 (91.9%)
Gibson	9 (15%)	51 (85%)	9 (14.5%)	53 (85.5%)
Line	2 (3.3%)	58 (96.7%)	3 (4.8%)	59 (95.2%)
Mackie	0	60 (100%)	0	62 (100%)
Pontiac	6 (10%)	54 (90%)	8 (12.9%)	54 (87.1%)
Zildjian	0	60 (100%)	1 (1.6%)	61 (98.4%)

Player N = 60, Watcher N = 62

Hypothesis 2 predicted that video game players and spectators would experience a similar persuasion effect from exposure to brands within the video game. A one-way analysis of variance (ANOVA) that compared the intent to purchase in-game brands between players ( $N = 60$ ) and watchers ( $N = 62$ ) did not generate significant results in any in-game brand with the exception of Gibson (see Table 4.3). Players ( $M = 2.32$ ,  $SD = 1.21$ ) indicated a greater intent to purchase Gibson products than watchers ( $M = 1.85$ ,  $SD = 1.17$ ,  $F(1, 120) = 4.57$ ,  $p < .05$ ). A one-way ANOVA that compared the differences in brand interest between players and watchers revealed significant results for Gibson and Zildjian (see Table 4.4). For Gibson, players showed greater interest ( $M = 2.52$ ,  $SD = 3.21$ ) than watchers ( $M = 1.91$ ,  $SD = 2.55$ ,  $F(1, 120) = 7.45$ ,  $p < .05$ ). For Zildjian, players indicated greater interest in the brand ( $M = 2.13$ ,  $SD = 1.13$ ) than watchers ( $M = 1.69$ ,  $SD = 1.04$ ,  $F(1, 119) = 5.086$ ,  $p < .05$ ). Hypothesis 2 therefore receives support.

To account for differences in players and watchers regarding music and music-related products, a one-way ANOVA examined the differences between players and watchers with regards to interest in the rock music genre and interest in playing a “real” guitar. Although significant differences did not exist in terms of playing a “real” guitar, the test revealed a significant difference in rock music interest (see Table 4.5). Players reported a greater interest in

rock music ( $M = 5.67$ ,  $SD = 1.59$ ) than watchers ( $M = 4.95$ ,  $SD = 1.92$ ,  $F(1, 120) = 15.59$ ,  $p < .05$ ).

**Table 4.3**  
**ANOVA: Players vs. Watchers and Purchase Intent**

	<b>Players</b>	<b>Watchers</b>		
<b>Brand</b>	<b>Mean (SD)</b>	<b>Mean (SD)</b>	<b>F value (df)</b>	<b>Significance</b>
Gibson	2.32 (1.21)	1.85 (1.17)	4.57 (1, 120)	.035

N = 122, 1 = Unlikely Purchase, 7 = Very Likely Purchase

**Table 4.4**  
**ANOVA: Players vs. Watchers and Brand Interest**

	<b>Players</b>	<b>Watchers</b>		
<b>Brand</b>	<b>Mean (SD)</b>	<b>Mean (SD)</b>	<b>F value (df)</b>	<b>Significance</b>
Zildjian	2.13 (1.13)	1.69 (1.04)	5.09 (1, 119)	.026
Gibson	2.87 (1.33)	2.23 (1.26)	7.45 (1, 120)	.007

N = 122, 1 = No Interest, 7 = Strong Interest

**Table 4.5**  
**ANOVA: Players vs. Watchers and Rock Music Interest**

	<b>Mean</b>	<b>SD</b>	<b>F value (df)</b>	<b>Significance</b>
<b>Players</b>	5.67	1.59		
<b>Watchers</b>	4.95	1.92	15.59 (1, 120)	.027

N = 122, 1 = No Interest, 7 = Strong Interest

Hypothesis 3 predicted that subjects would remember more in-game brands for personally relevant or familiar products. The question after the unaided recall section that asked whether subjects regularly use any of the brands listed in the unaided recall section did not yield any results. Experience with musical instruments therefore served as the factor that determined personal relevance with the assumption that greater experience with an instrument leads music-related products to have greater personal relevance. The guitar, bass guitar, drums, and keyboard experience questions were combined to create a scale of instrument experience, which was then

categorized further into high or low instrument experience. A 2 x 2 Chi-Square analysis revealed a significant relationship between aided recall and instrument experience for the Line 6 ( $\chi^2 (1, N = 118) = 3.85, p = .05$ ) brand. Another 2 x 2 Chi-Square that combined instrument experience and unaided recall found a significant relationship in the Gibson brand ( $\chi^2 (1, N = 121) = 10.79, p = .001$ ). Subjects with more instrument experience were more likely to recall the brands than subjects with no instrument experience for the two brands. Interestingly, a 2 x 2 Chi-Square that examined the relationship between “real” instrument experience and the survey question that asked participants to identify the product category of each in-game brand revealed no significance. Hypothesis 3 therefore receives support.

**Table 4.6**  
**“Real” Instrument Experience Frequencies**

<b>Instrument</b>	<b>No Experience</b>	<b>Beginner</b>	<b>Intermediate</b>	<b>Advanced</b>	<b>Expert</b>
Guitar	113 (53.8%)	66 (31.4%)	18 (8.6%)	10 (4.8%)	3 (1.4%)
Bass Guitar	162 (77.1%)	25 (11.9%)	13 (6.2%)	10 (4.8%)	0
Drums	156 (74.3%)	37 (17.6%)	11 (5.2%)	5 (2.4%)	0
Keyboard	113 (53.8%)	60 (28.6%)	24 (11.4%)	9 (4.3%)	3 (1.4%)

**Table 4.7**  
**Chi-Square: “Real” Instrument Experience and Aided Recall**

<b>Brand</b>	<b>N</b>	<b>F value (df)</b>	<b>Significance</b>
Line 6	118	3.85 (1)	.05

**Table 4.8**  
**Chi-Square: “Real” Instrument Experience and Unaided Recall**

<b>Brand</b>	<b>N</b>	<b>F value (df)</b>	<b>Significance</b>
Gibson	121	10.79 (1)	.001

Hypothesis 4 predicted that subjects would recall more in-game brands for salient products. To determine salience, the question that asked for the time period in which subjects had last seen an ad for each brand was divided into two categories, one in which participants had seen an ad for the brand and one in which subjects had never seen an ad for the brand. A 2 x 2 Chi-Square was performed to determine the relationship between ad salience and both aided and unaided recall for each brand. Significant relationships were revealed for the Pontiac ( $X^2 (1, N = 121) = 5.50, p < .05$ ), Line 6 ( $X^2 (1, N = 118) = 13.56, p < .001$ ), and Zildijan ( $X^2 (1, N = 122) = 12.93, p < .001$ ) brands for aided recall and Gibson ( $X^2 (1, N = 122) = 11.86, p < .001$ ) for unaided recall. Subjects who had seen an ad for the specified brands in the past had a greater likelihood of recalling the brand through unaided or aided recall. A 2 x 2 Chi-Square that examined the relationship between “real” instrument experience and whether or not subjects had seen advertisements for music products only revealed a significant relationship for the Zildijan brand ( $X^2 (1, N = 121) = 7.51, p < .01$ ). Hypothesis 4 therefore receives support.

**Table 4.9**  
**Chi-Square: Brand Salience and Aided Recall**

Brand	N	F value (df)	Significance
Pontiac	121	5.50 (1)	.019
Line 6	118	13.56 (1)	.000
Zildijan	122	12.93 (1)	.000

**Table 4.10**  
**Chi Square: Brand Salience and Unaided Recall**

Brand	N	F value (df)	Significance
Gibson	122	11.86	.001

Hypothesis 5 predicted that subjects in the high cognitive load condition would recall fewer in-game brands than subjects in a low cognitive load condition. A 2 x 2 Chi-Square was



performed for each brand in an effort to locate a relationship between cognitive load, unaided recall, and aided recall. The test did not reveal a significant relationship for any brand.

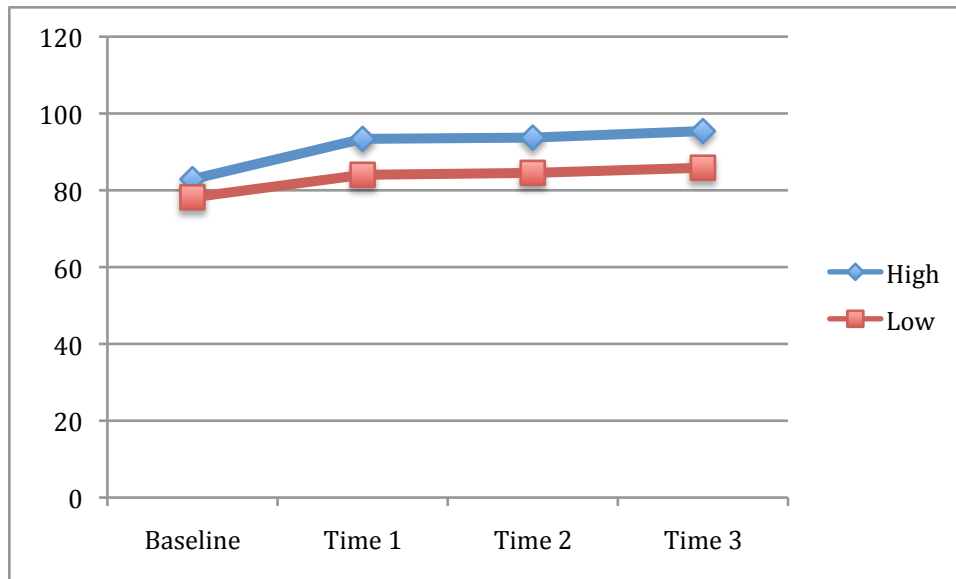
Hypothesis 5 therefore does not receive support.

Hypothesis 6 predicted that subjects in the high cognitive load condition would experience a greater cognitive burden than subjects in the low cognitive load condition. Cognitive load was determined according to how much the subjects needed to concentrate during stimulus exposure. The concentration variable was measured by recording the heart rate throughout stimulus exposure. The tonic (long-term) heart rate data was divided into 3 time periods: time 1, time 2, and time 3. Data was measured in beats per minute (BPM). A repeated measures ANOVA was computed to determine the heart rate differences between subjects in both cognitive load conditions. The comparison yielded significant results. Subjects in the high cognitive load condition exhibited a higher overall heart rate in time 1 ( $M = 93.39$ ,  $SD = 20.47$ ), time 2 ( $M = 93.72$ ,  $SD = 20.87$ ), and time 3 ( $M = 95.42$ ,  $SD = 22.93$ ). Subjects in the low cognitive load condition exhibited a lower overall heart rate for time 1 ( $M = 84.02$ ,  $SD = 22.52$ ), time 2 ( $M = 84.53$ ,  $SD = 21.99$ ), and time 3 ( $M = 85.87$ ,  $SD = 21.16$ ). The between-subjects effect exhibited significance ( $F(1, 117) = 5.78$ ,  $p < .05$ ). The data did not support Hypothesis 6.

**Table 4.11**  
**Between-Subjects Repeated Measures ANOVA: Cognitive Load vs. Heart Rate**

Time 1		Time 2		Time 3		F value (df)	Significance
Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>	<i>High</i>	<i>Low</i>		
93.39 (20.47)	84.03 (22.52)	93.72 (20.87)	84.53 (21.99)	95.42 (22.93)	85.87 (21.16)	5.78 (1, 117)	.018

Data measured in beats per minute (BPM)

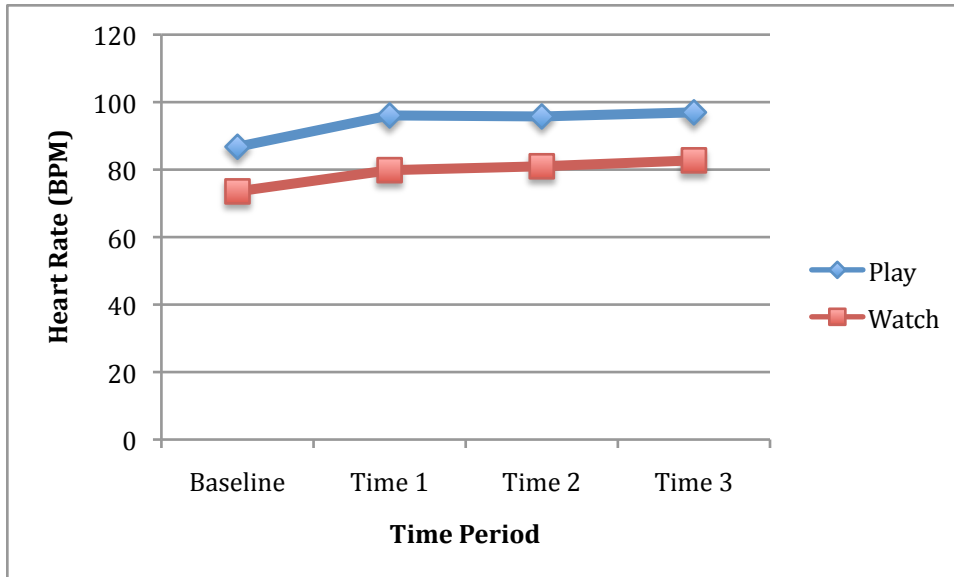


**Figure 4.12**  
**High vs. Low Cognitive Load Heart Rates Across Time**

Hypothesis 7 predicted that players would concentrate more during stimulus exposure than watchers. A repeated measures ANOVA compared the mean heart rates of players and watchers. The test yielded significant results. The players exhibited an overall higher heart rate during time 1 ( $M = 96.06$ ,  $SD = 23.91$ ), time 2 ( $M = 95.76$ ,  $SD = 24.18$ ), and time 3 ( $M = 96.98$ ,  $SD = 24.41$ ) than watchers. The overall watcher heart rate was lower during time 1 ( $M = 79.8371$ ,  $SD = 16.81$ ), time 2 ( $M = 80.99$ ,  $SD = 16.62$ ), and time 3 ( $M = 82.75$ ,  $SD = 17.55$ ). The between-subjects effect was significant ( $F(1, 117) = 16.82$ ,  $p < .001$ ). Since a low heart rate indicates concentration, the data do not support Hypothesis 7.

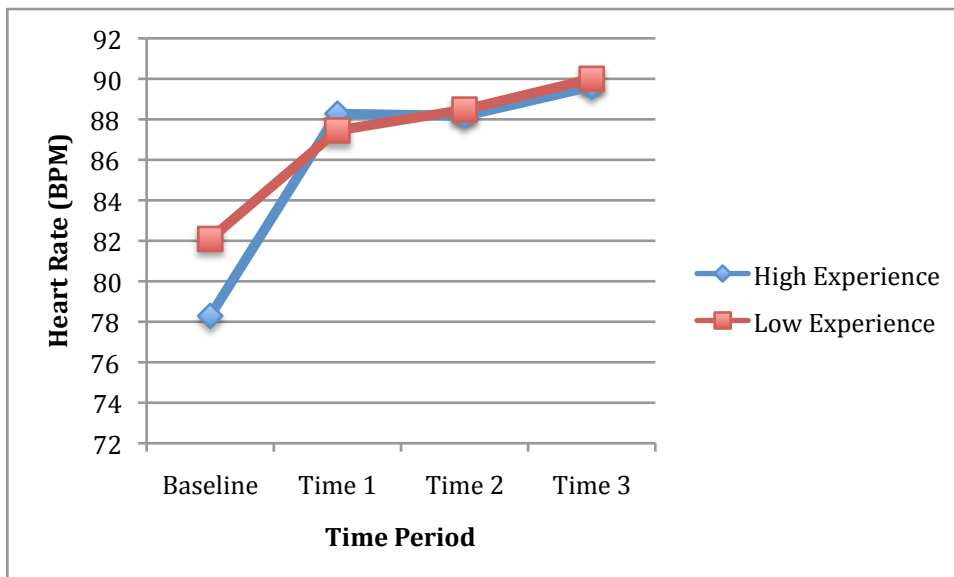
**Table 4.13**  
**Between-Subjects Repeated Measures ANOVA: Play or Watch vs. Heart Rate**

Time 1		Time 2		Time 3		F value (df)	Significance
Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)		
<i>Play</i>	<i>Watch</i>	<i>Play</i>	<i>Watch</i>	<i>Play</i>	<i>Watch</i>		
96.06 (23.91)	79.84 (16.81)	95.76 (24.18)	80.99 (16.62)	96.98 (24.41)	82.75 (17.55)	16.82 (1, 117)	.000

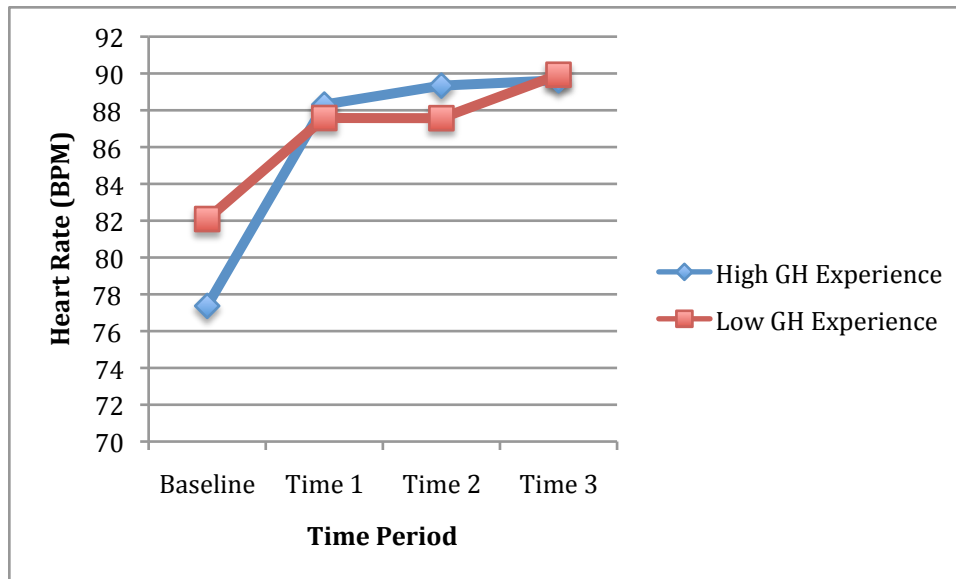


**Figure 4.14**  
**Player vs. Watcher Heart Rate Across Time**

Hypothesis 8 predicted that inexperienced gamers would concentrate more on playing the video game than experienced gamers. A repeated measures ANOVA that compared the mean heart rates of experienced and inexperienced gamers did not yield significant results. The same test using Guitar Hero experience rather than general gaming experience also did not reveal significant differences between the two groups. Hypothesis 8 is therefore not supported.



**Figure 4.15**  
**Experienced vs. Inexperienced Player Heart Rates**



**Figure 4.16**  
**Experience vs. Inexperience with Guitar Hero Player Heart Rates**

Hypothesis 9 predicted that experienced gamers would remember more in-game brands than inexperienced gamers. A 2 x 2 Chi-Square test examined the relationship between gamer experience and both aided and unaided recall. The only significant relationships were found in Line 6 aided recall and Gibson unaided recall. For Line 6 ( $\chi^2 (1, N = 119) = 9.7, p < .05$ ), subjects with a high level of gaming experience were more likely to remember the brand. For Gibson ( $\chi^2 (1, N = 122) = 8.07, p < .05$ ), subjects with high gaming experience were more likely to recall the brand. The remaining brands did not yield significant results. Hypothesis 9 therefore receives support.

**Table 4.17**  
**Chi-Square: Gamer Experience and Aided Recall**

Brand	N	F value (df)	Significance
Line 6	119	9.7 (1)	.002

**Table 4.18**  
**Chi Square: Gamer Experience and Unaided Recall**

Brand	N	F value (df)	Significance
Gibson	122	8.07 (1)	.004

Hypothesis 10 predicted that subjects would remember more incongruent in-game brands than brands that reflect the subject of the game. When asked to rate each brand's "fit" within the game, Line 6 ( $M = 4.28$ ,  $SD = 1.52$ ), Zildijan ( $M = 4.68$ ,  $SD = 1.73$ ), and Gibson ( $M = 5.52$ ,  $SD = 1.76$ ) received the most positive ratings on a scale from strongly disagree (1) to strongly agree (7), while Pontiac ( $M = 2.57$ ,  $SD = 1.40$ ), Axe, ( $M = 2.78$ ,  $SD = 1.67$ ), and Mackie ( $M = 3.94$ ,  $SD = 1.57$ ) received lower ratings. The question was recoded into "Belong," "Does not belong," and "Neutral." A 2 x 2 Chi-Square examined the relationship between each subject's rating of the brand's fit in the game and both aided and unaided recall. For Line 6 aided recall ( $X^2 (2, N = 118) = 13.18, p = .001$ ), Line 6 unaided recall ( $X^2 (2, N = 121) = 8.50, p < .05$ ), Mackie aided recall ( $X^2 (2, N = 120) = 6.75, p < .05$ ), and Zildijan aided recall ( $X^2 (2, N = 120) = 14.55, p = .001$ ) the observed values were significantly higher than expected values for positive brand fit and brand recall. Hypothesis 10 therefore receives support.

**Table 4.19**  
**Perceived Brand Fit in Guitar Hero**

	Line 6	Zildijan	Gibson	Pontiac	Axe	Mackie
Mean	4.28	4.68	5.52	2.57	2.78	3.94
SD	1.52	1.73	1.76	1.40	1.67	1.57

1 = Strongly Disagree, 7 = Strongly Agree

**Table 4.20**  
**Chi-Square: Brand Fit and Aided Recall**

Brand	N	F value (df)	Significance
Line 6	118	13.18 (2)	.001
Mackie	120	6.75 (2)	.034
Zildijan	120	14.55 (2)	.001

**Table 4.21**  
**Chi-Square: Brand Fit and Unaided Recall**

Brand	N	F value (df)	Significance
Line 6	121	8.50 (2)	.014

Hypothesis 11 predicted that subjects would exhibit negative attitudes towards incongruent in-game brands. Four questions pertaining to brand attitude for each brand were combined to create an attitude scale for each brand. All scales exhibited high Cronbach's Alpha levels (see Table 4.22). A 2 x 2 Chi Square that examined the relationship between the perceived fit of the brand within the game and brand attitude revealed significant relationships for each brand. For Pontiac ( $X^2 (2, N = 122) = 8.84, p < .05$ ), subjects who did not believe the brand fit in the game were more likely to report a negative attitude toward the brand. For Axe ( $X^2 (2, N = 121) = 18.65, p < .001$ ), subjects who did not believe the brand fit in the game were more likely to exhibit a low brand attitude.

The opposite trend was found for the Line 6 ( $X^2 (2, N = 119) = 32.11, p < .001$ ), Mackie ( $X^2 (2, N = 121) = 67.20, p < .001$ ), Zildijan ( $X^2 (2, N = 118) = 78.92, p < .001$ ), and Gibson ( $X^2 (2, N = 120) = 52.55, p < .001$ ) brands in that respondents who believed the music-related brands fit in the game were more likely to report a positive attitude towards the brands (see Table 4.23).

**Table 4.22**  
**Cronbach's Alpha Levels for Brand Attitude Scales**

Brand	N	Mean (SD)	Cronbach's Alpha
Pontiac	4	12.34 (4.453)	.836
Axe	4	17.55 (5.371)	.858
Line 6	4	15.88 (4.699)	.920
Mackie	4	15.02 (4.873)	.944
Zildijan	4	18.25 (6.211)	.935
Gibson	4	42.605 (6.527)	.967

**Table 4.23**  
**Chi-Square: Perceived Brand Fit and Brand Attitude**

Brand	N	F value (df)	Significance
Pontiac	122	8.84 (2)	.012
Axe	121	18.65 (2)	.000
Line 6	119	32.11 (2)	.000
Mackie	121	52.55 (2)	.000
Zildijan	118	78.92 (2)	.000
Gibson	120	52.55 (2)	.000

### Results of Research Question Testing

The first research question asked whether exposure to a video game affects purchase intent for the six in-game brands. In a one-way analysis of variance (ANOVA), no comparisons yielded significant results. The Zildijan brand approached significance at  $p = .068$  (Experiment  $M = 4.44$ ,  $SD = .906$ ; Control  $M = 4.19$ ,  $SD = 1.090$ ), but no other significant results were observed.

The second research question asked whether game liking affected brand attitude. A scale of Guitar Hero game rating questions was created with a Cronbach's Alpha of .971. A one-way ANOVA compared the attitude scales of the six brands and the variable of game liking to reveal significant differences in brand attitude between subjects who liked and disliked the game for all of the music-related brands. Results for Pontiac and Axe did not reveal significant results.

**Table 4.24**  
**ANOVA: Game Liking vs. Brand Attitude**

	Low Game Liking	High Game Liking		
	Mean (SD)	Mean (SD)	F value (df)	Significance
Gibson	-.52 (1.06)	.35 (.79)	26.69 (1, 118)	.000
Zildijan	-.34 (1.06)	.23 (.89)	10.06 (1, 118)	.002
Mackie	-.30 (1.06)	.20 (.91)	7.73 (1, 119)	.006
Line 6	-.33 (1.12)	.21 (.86)	8.83 (1, 118)	.004
Axe	-.13 (.94)	.09 (1.03)	1.35 (1, 119)	.247
Pontiac	-.33 (1.05)	.000 (.93)	.000 (1, 120)	.994

**Table 4.25**  
**Summary of Hypothesis and Research Question Testing**

	<b>Hypothesis</b>	<b>Result</b>
H1	Video game players and spectators will exhibit a similar level of brand recall.	Support
H2	Video game players and spectators will exhibit a similar level of persuasion.	No Support
H3	Subjects will remember more brands for personally relevant or familiar products.	Support
H4	Subjects will recall more in-game advertisements for salient products.	Support
H5	Subjects in the high cognitive load game condition will recall fewer in-game brands than subjects in a low cognitive load game.	No Support
H6	Subjects in a high cognitive load condition will concentrate more than subjects in a low cognitive load condition.	No Support
H7	Players will concentrate more than watchers during stimulus exposure.	No Support
H8	Inexperienced video game players will concentrate more on the video game than experienced players.	No Support
H9	Experienced gamers will remember more in-game brands than inexperienced gamers.	Support
H10	Subjects will remember more incongruent in-game brands than brands that reflect the subject of the game.	Support
H11	Subjects will exhibit negative attitudes towards incongruent in-game ads.	Support
RQ1	How does exposure to in-game brands through a video game affect the intent to purchase in-game brands?	No significant differences in purchase intent between the experiment and control groups.



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RQ2	How does game liking affect brand attitude?	Subjects who liked the game rated the music-related brands significantly higher than subjects who did not like the game.  No significant differences in brand attitude for non-music products.
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## **CHAPTER 5**

### **DISCUSSION AND CONCLUSIONS**

The current research primarily intended to test the validity of applying Lang's (2005) Limited Capacity Model of Mediated Motivated Message Processing (LC4MP) to the study of video games and in-game brand recall. The model, used primarily for television studies in past research, generally lacked predictive abilities when applied to the video game medium. One of Lang's (2005) main points in applying the LC4MP to video games concerns the ability of experienced gamers to dedicate fewer mental resources to actual game play than inexperienced gamers. The gamer may use additional mental resources to process other aspects of the gaming experience, such as the environment. The current study predicted that the use of additional mental resources in processing the environment would lead to greater recall of brands within the gaming environment. Yet the presented research reveals very few differences between inexperienced and experienced gamers in terms of brand recall and concentration on the video game. Overall, the research suggests that significant differences exist between game players and watchers as opposed to experienced and inexperienced gamers.

Overall, very few participants accurately recalled in-game brands. A majority of the subjects did not acknowledge seeing any of the brands in the game, with the exception of Gibson. The use of a non-racing video game may have influenced recall in that subjects may have been more engaged in the game. Subjects watching the racing game in Nelson, Yaros, and Keum's (2006) study may have experienced boredom and may have chosen to visually explore the gaming environment. Guitar Hero, on the other hand, presents constantly changing patterns of brightly colored "notes" combined with loud, upbeat music. Such qualities may have drawn and held the spectators' attention on actual game play, thereby reducing the likelihood that spectators would explore the game environment. Lang (2005) would infer that the game placed a

high demand on cognitive load and required a great deal of concentration from gamers to the extent that spectators felt a similar need to concentrate on the game.

The study by Nelson, Yaros, and Keum (2006) also noted similar persuasion effects in players and spectators, which led to the prediction in the current study that video game players and spectators would exhibit similar levels of persuasion. The data support the study with the exception of Gibson and Zildijan, as players indicated a higher intent to purchase the brands than watchers. The differences between players and watchers in purchase intent and brand interest may have resulted from the players' latent desire to be a musician. Guitar Hero allows players to simulate the feeling of a "rock star," so players may have experienced greater persuasion effects simply from the simulation. Players overall showed more interest in the rock music genre than watchers, so the greater interest in Gibson guitars might have stemmed from a greater interest in rock music. As noted in the LC4MP, an increase in relevance leads to a greater likelihood of encoding. Rock music's greater relevance to the player group likely increased the chance of encoding Gibson, a brand associated with rock n' roll. Yet an additional explanation for the differences stems from the fact that the experiment moderator allowed subjects to self-select positions in the playing or watching conditions. Subjects who wanted to play the game likely had a greater motivation to play the game and therefore had a greater interest in music-related brands. Such pre-existing conditions may have skewed the data.

Although players may have exhibited more interest in some music-related brands, few brands were actually relevant to the subjects. As previously mentioned, few subjects in the study reported high levels of experience with musical instruments. Brand relevance likely decreases if an individual does not directly interact with the brand's product category. Additionally, brand salience likely decreases because individuals who do not use or interact with a brand likely do

not receive exposure to advertisements for the brands. Music brands especially do not advertise in the mainstream media and would likely limit advertising to trade publications or music-specific media like guitar magazines.

In terms of experience with musical instruments and recall, Line 6 produced significant results for aided recall and Gibson produced significant results for unaided recall. A significant relationship likely existed between high instrument experience and Line 6 recall because Line 6 makes amplifiers for guitars. Fifty-four (44.3%) respondents noted some form of guitar experience while 21 (17%) reported experience with the bass guitar, leaving 75 (31%) total responses that acknowledged guitar experience. Subjects familiar with guitars and guitar products had more than likely at least heard of the Line 6 brand. Yet such an explanation lacks validity in the current study because as noted in the results, experience with a “real” instrument does not increase the likelihood that a subject would have the ability to correctly identify the brand’s product category. The finding could indicate that subjects used context clues to guess the brand’s product category. The Line 6 logo appeared on several amplifiers in the game environment, so subjects who saw the brand could have easily assumed that Line 6 produces sound equipment. Since 70 (58.3%) of respondents indicated that Line 6 belongs in the sound equipment product category, such an assumption could have validity. Thus the aided recall results for Line 6 may have resulted more from the brand’s presentation in the game rather than from brand relevance. Such a finding bears significant implications for a new brand or relatively unknown brand in a game setting because the brand’s application in the game may provide cues that add context to the nature of the brand.

The unaided recall results of the Gibson brand with regards to relevance may stem from the fact that 93 (76.2%) subjects indicated at least some interest in the rock music genre and 60

(49%) subjects indicated at least some interest in playing a “real” guitar. Yet at the same time, the lack of experienced musicians in the subject pool make valid assumptions about the personal relevance of Gibson products nearly impossible. The significant recall levels of the Gibson brand may have also resulted from the brand’s central role in the video game. A miniature version of a Gibson Les Paul guitar served as the video game controller for the game. The controller also featured the Gibson logo on the guitar’s neck. Participants directly interacted with the branded Gibson product, which may have influenced unaided recall.

The salience hypothesis also presented some problems because most of the in-game brands advertise music products, which the public generally does not consume. One assumption leads to the belief that subjects who report experience with “real” instruments would have a greater likelihood of seeing an ad for an in-game brand in Guitar Hero than subjects with no real instrument experience. Yet, as indicated in the results, only the Zildjian brand presented a significant relationship between instrument experience and ad exposure. The test did not include Pontiac, as musicians would not necessarily rate the brand as personally relevant. Line 6 revealed a significant relationship between instrument experience and recall. The brand’s significance in terms of personal relevance as indicated in Hypothesis 3 may have increased the likelihood of exposure to a Line 6 advertisement. Greater brand salience leads to a greater likelihood of encoding, which in turn lends support to the LC4MP. Yet at the same time, the survey did not validate whether or not subjects had actually seen an advertisement for Gibson or Line 6 products. The lack of musicians in the population suggests that subjects most likely had not seen ads for any of the music products. Only the Zildjian brand provides evidence of a link between instrument experience, ad exposure, and aided recall. Although the results do not apply to all brands, the significant results for the Zildjian brand provide evidence that brand relevance

and salience contribute to brand recall in a gaming environment. Further research using brands in other product categories may validate the results.

The fifth hypothesis, in line with the LC4MP, predicted that subjects in a high cognitive load game would recall fewer in-game brands than subjects in a low cognitive load game because high cognitive load games require more mental resources to process. Yet the results did not support the hypothesis. Part of the reason for the lack of support may be attributed to the fact that the Guitar Hero game in general demands a higher cognitive load than a video game like a racing game. As previously noted, the game constantly changes and presents challenging note patterns that attract attention. The amount of cognitive load that each condition placed on the player's mind therefore may not have had a significant effect on brand recall because the game in general places a high cognitive load on the processing abilities of the gamer. A different type of video game, such as a car racing game, may have produced different results. A game like a racing game does not require much concentration and allows the user to passively play the game, but Guitar Hero demands active concentration in that the game requires gamers to remain actively engaged in the changing patterns of notes within each song. The lack of difference in brand recall rates between the high and low cognitive load conditions may therefore exist more as a result of the nature of the video game itself rather than as a result of the cognitive load that a particular condition demanded.

The physiological data provided more insight into the reasons for the lack of support for the cognitive load hypothesis. Three hypotheses made predictions about the outcomes of the heart rate data by using low heart rate as an indicator of concentration and the level of cognitive demand placed on subjects' minds during stimulus exposure. The heart rate data for each hypothesis would seemingly indicate a lower heart rate for subjects who concentrated on the

game more than others. Yet the heart rate data did not support any of the hypotheses and instead showed that subjects who, according to the hypotheses, should have exhibited a lower heart rate actually exhibited higher heart rates.

For Hypothesis 6, subjects in the high cognitive load condition exhibited consistently higher heart rates than subjects in the low cognitive load condition. The challenge of playing a difficult game likely led subjects to experience excitement or arousal rather than concentration. Research by Lacey and Lacey (1970) indicates that when presented with a difficult task or a distracting stimulus, heart rate increases dramatically. The action of playing a more cognitively demanding game may have led subjects in the high cognitive load condition to experience a greater level of excitement or adrenaline rush. The task of hitting difficult combinations of notes in rapid succession to the beat of a fast-paced rock n' roll song likely served as a distracting stimulus that did not allow the player to relax or concentrate.

Although the heart rates in the high and low cognitive load conditions differed, both conditions exhibited the same general heart rate pattern. From the baseline period to the first time period, the heart rate increased significantly because the stimulus exposure began in the first time period. Minimal difference existed between the heart rates in the first and second time periods. Yet between the second and third time periods, heart rate increased again. Both the high and low cognitive load songs in the game featured a "guitar solo" near the end of the song that slightly increased the difficulty of the song. Such a trend lends support to the inference that the Guitar Hero game in general, regardless of individual song difficulty, places a higher cognitive load on players than the average video game because the game requires coordination and attentive players. The similarity in the patterns of heart rate data between the high and low cognitive load conditions may help to explain why brand recall results did not differ between

subjects in the two conditions. If subjects experienced a similar level of arousal and excitement in both conditions, then subjects were likely as unable to process in-game brands in both conditions.

A comparable explanation for the heart rate data applies to Hypothesis 7, as players consistently exhibited higher heart rates than watchers. The players actually engaged in the stimulus, while the watchers merely observed. Naturally, an individual who engages in the physical activity of pressing buttons in time with music should exhibit a higher heart rate than an individual who simply sits in a chair. As in the cognitive load data, players and watchers showed a somewhat similar heart rate pattern. From baseline to the first time period, heart rate increased significantly. From the first time period to the second time period, players showed a slight decrease in heart rate, while watchers showed a slight increase in heart rate. From the second to third time periods, players' heart rates increased slightly while watchers' heart rates continued to increase slightly. Again, the increase in heart rate may have resulted from the presence of a harder "solo" portion at the end of the song. Although players and watchers did not exhibit the same patterns of heart rates, the data bodes well for in-game advertisers because the similar heart rates indicate that players and watchers may experience similar effects during game play. The watchers, although not as excited or aroused as the players, experienced some effects as a result of the game. The increasing popularity of social video games like Guitar Hero that encourage group play will likely lead to an increased emphasis on the effects of video games on game spectators.

Hypothesis 8 did not receive support from the heart rate data, as inexperienced and experienced participants did not exhibit significantly different heart rate data except in the baseline data. Inexperienced gamers began the game with a higher heart rate than experienced



gamers. Inexperienced gamers may have felt more anxiety before playing the video game because they lacked experience with the game, which explains the higher baseline heart rate. Otherwise, the data did not differ between experienced and inexperienced gamers. One of the primary assertions of the LC4MP involved the prediction that more experienced gamers would have a greater ability to process the gaming environment because the experienced gamers dedicate few mental resources to actual game play because the control motions become automatic after time. Yet the heart rate data provides evidence that, at least for the Guitar Hero game, inexperienced and experienced players experienced a similar level of arousal and excitement during stimulus exposure.

The results may help to explain the outcome of Hypothesis 9, which predicted that experienced gamers would exhibit higher brand recall levels. The data likely did not support the hypothesis because, as the heart rate data indicates, experienced and inexperienced gamers showed similar physiological effects. Such results suggest that the LC4MP overestimated the effects of gaming experience on mental processing because no data in the current research supports such an assertion. The results, however, may only apply to Guitar Hero, as the game offers a unique gaming experience. Further research into other types of games should investigate the differences between experienced and inexperienced gamers.

The discrepancy between the heart rate hypotheses and the results of testing the hypotheses raises some questions about the accuracy of using heart rate as a measure of cognitive load or concentration. The data did not support any of the heart rate hypotheses. The main issue in translating the data lies in using the word “concentration” to describe what players experience while playing a video game. The LC4MP designates degree of concentration as an indicator of high or low cognitive load in terms of video games. A decrease in heart rate

signifies concentration. Yet, as the data reveal, subjects in the experiment experienced an increase in heart rate throughout game play. Such results indicate that when determining cognitive load in a video game, researchers should rely on the game's rating of difficulty rather than on physiological measures. The data indicate that both players and watchers experience arousal and excitement during game play. Physiological measures may serve as accurate measures of concentration for a passive medium like television that does not require active engagement in the medium to receive the intended message. Video games, on the other hand, require gamers to actively engage in and control the actions of the game. The LC4MP should therefore utilize another method of determining cognitive load, such as task difficulty, to measure cognitive load.

The final two hypotheses involved brand "fit" in the game, recall, and brand attitude. Hypothesis 10 predicted that participants would remember more brands for products that "fit" with the subject of the game, such as the music products, as opposed to brands that do not "fit" the game. Line 6 fared well in both aided and unaided recall in that subjects who believed the brand belonged in the game were more likely to recall the brand. Zildijan and Mackie also generated significant results in the aided recall category. Yet the results should be considered with caution in that subjects could barely identify Mackie's product category, with 52 (43%) identifying the brand as sound equipment, 39 (32.2%) identifying the product category as video equipment, and 22 (18.2%) identifying the product category as musical instruments. Yet by the end of the survey, subjects could most likely deduce that all of the products besides Pontiac and Axe belonged in a music-related category.

In determining whether a brand's "fit" within the video game affected brand attitude, the data reveal that a greater fit within the game led to a higher brand attitude. Previous research has

provided evidence of a relationship between brand attitude and congruent in-game brand placement (Lewis, 2006). The data support the hypothesis for all brands. Subjects were more likely to report a positive attitude for the music brands because the subjects rated the brands more positively in terms of fit within the game. On the contrary, subjects were more likely to rate the Pontiac and Axe brands negatively because few participants believed that the brands fit in the video game. The data further emphasize the warning presented from other in-game brand literature that asserts that although incongruent brands “stick out” in game play, the incongruent brands risk developing a negative brand attitude from gamers.

Two research questions compared the results of the surveys of the experiment group to a control group that did not undergo exposure to the Guitar Hero video game. The first research question asked whether exposure to in-game brands through a video game affected the intent to purchase in-game brands and found that exposure to a brand through a video game did not increase purchase intent. The lack of significance may simply result from the lack of musicians in the subject pool. People who do not play musical instruments most likely do not have a need for music-related products. Additionally, the presence of brands within a game environment does not provide any persuasive messages. The presence of in-game brands likely serves more of a brand awareness or brand attitude purpose as opposed to a persuasive purpose. A brand placement in a video game could potentially elicit long-term effects in purchase intent. Viewing a brand repeatedly within a game environment over an extended period of time could potentially influence an individual’s perception of the brand over time.

The third research question addressed the effect of game liking on brand attitude. A majority of participants rated the game very positively, regardless of gaming experience or experience with Guitar Hero. Interestingly, results revealed a strong relationship between game

liking and liking of brands that fit in the game. Subjects who liked the game were more likely to rate the incongruent brands, Pontiac and Axe, more negatively. Such results indicate that participants may have believed that the incongruent brands tainted the music-centered purpose of the game. The results provide further evidence that in-game brands should at least somewhat contribute to the realism in the game, especially in a game like Guitar Hero that has a well-defined theme. The data also support previous research that indicates that gamers do not mind in-game branding as long as the brands contribute to the realism of the game.

In summary, the current study as a whole does not lend support to the use of the Limited Capacity Model of Mediated Motivated Message Processing as a framework for studying embedded brands in video games. The model has worked in studies of television, yet did not exhibit the same amount of effectiveness in the current study. Although the model's propositions about brand relevance, brand salience, and the likelihood of encoding were not overwhelmingly significant as a result of the lack of relevance between the in-game brands and the study participants, the current study offers some argument to invalidate the use of gamer experience as a variable to predict the likelihood of encoding. In the LC4MP, Lang (2005) predicted that experienced gamers would have a greater ability to process the gaming environment than inexperienced gamers. Out of all of the individual-level variables tested, gamer experience did not yield any significant results. The LC4MP also lacked predictive ability in the area of cognitive load. Neither cognitive load nor gamer experience affected subjects' coding ability, according to the research. The LC4MP therefore requires some revision to validate usefulness in the model's application to video games, as video games differ significantly from television.

The brand recall results of the study indicate that Gibson fared the best in nearly all recall categories. Some reasons for the success of the in-game placement, as noted before, include the significant role that the branded Gibson controller plays in game play and the distinct Les Paul model of the controller. After an experiment session, one participant noted, “Of course I knew Gibson was in the game—the controller is a Les Paul.” Guns N’ Roses guitarist and celebrity endorser of the Guitar Hero video game Slash coincidentally plays a Les Paul and has his own signature Les Paul line (“Custom Les Paul,” 2008). Gibson has produced guitars since 1894 and enjoys international recognition (Whitwell, 2007). One need not achieve rock n’ roll fame to know that Gibson produces guitars. Such factors may have increased the likelihood that subjects in the experiment would recall a guitar brand in a rock n’ roll music video game.

Yet at the same time, the Pontiac and Axe brands occupy a significant presence in the general consumer market. One cannot watch television for more than two hours without viewing a racy commercial for the newest Axe product or a rugged commercial for a Pontiac truck. Differences in the presentations of the in-game brands may explain why Gibson surpassed both Axe and Pontiac in brand recall. Although the current study considered Gibson as an in-game brand, the brand’s tangible presence in reality could have affected brand recall because subjects directly interacted with the brand. Pontiac, though prominently placed, merely appeared in the background of the game environment. Axe, however, appeared on the guitar of the character that the player controlled. Both Gibson and Axe were placed in a manner that allowed direct brand interaction in two different forms: actual and virtual. Gibson consistently produced significant results in recall. Such results suggest that direct interaction with a product while gaming increases the likelihood that the gamer will remember the branded product.

The research bears significant implications for in-game advertisers in that a brand's fit within the video game can influence brand attitude. To gain more insight into the goals and expectations of a brand placement in Guitar Hero, the researcher interviewed Erik Tarkiainen, Vice-President of Marketing Communications for Line 6, Inc. Tarkiainen indicated that the decision to place the Line 6 logo in the Guitar Hero environment stemmed from a desire to link Line 6, a non-traditional company, with the video game essentially as a means of branding. Tarkiainen described the series of considerations behind the brand placement:

**Tarkiainen:** "There's three considerations that go into this, and the first is does it add any value or benefit to actual guitarists, and it doesn't... The second consideration is is it detrimental to our brand for a real guitarist to see us in a video game. And the cool thing about Guitar Hero is that it's not... Real guitarists actually like playing Guitar Hero... It's not uncool or cheap that a real guitarist sees Line 6 in Guitar Hero, so there was no detriment to the brand by being involved with it. The third consideration would be the value to new guitarists and I think that's huge. Not even new guitarists—for people who may aspire to play a guitar someday...our hope is that these millions of people who are spending hours and hours learning to play a facsimile of a guitar, if just some percentage of them say, 'You know, all the time I'm spending learning to play a not real guitar, what if I was trying to play a real guitar?'... It's subtle, it's subliminal, but when they walk into a music store, we hope they recognize a Line 6 logo. It's awareness or recall. We're not trying to convince people that we make good stuff because it appears in Guitar Hero. We're not trying to educate them about what we do. It's just hopefully, at some point down the road, they're in a music store and they say, 'Line 6, that sounds familiar.' When you're talking about millions and millions of people, it doesn't take that much to be worth it."

Although the data from the current study cannot determine whether exposure to the in-game brand leads to long-term awareness or purchase intent, the study at least indicates that the Line 6 brand achieved successful results in terms of recall and brand attitude. The company carefully considered the implications of a placement in the video game and achieved a logical fit. The third research question especially emphasizes the importance of brand congruence in a game because subjects harbored a negative brand attitude towards the brands that did not fit in Guitar Hero. Tarkiainen offered some insight into the importance of a brand's fit in the gaming environment:

**Tarkianien:** “There’s a point where over-promotion can turn against you... That’s what we were careful with and didn’t want to do with Guitar Hero is go too overboard to where you’re really in the players’ faces. They want to play the game, and they deserve to be able to do so without being hit with too much commercialism. And the thing that’s cool about Guitar Hero is the subtle branding and placement of products and the amps actually, I think, adds to the realism as opposed to being a commercial.”

Future brand managers who wish to incorporate a brand into the gaming environment should follow Line 6’s example in the types of considerations and precautions that should factor into an in-game branding decision. The results of the current study indicated that subjects generally perceived the Line 6 brand in a positive light. The brand managers of Pontiac and Axe likely did not consider the implications of a brand placement in Guitar Hero as carefully as Line 6. As a result, both Pontiac and Axe received somewhat negative brand evaluations. If all companies who engage in in-game branding take the time to carefully consider a brand’s fit within specific video games, gamers may eventually accept in-game advertising.

## CHAPTER 6 LIMITATIONS

Several limitations make the applications of the results in the current study difficult to apply to a broader audience. First, the in-game brands featured in *Guitar Hero III* do not represent a wide variety of mainstream product categories. Only Pontiac and Axe represent common product categories that the general public likely consumes on a somewhat regular basis. The hypotheses that concerned product relevance, product salience, purchase intent, and brand attitude therefore qualify for limited validity. People who do not regularly use or interact with music-related products would most likely not demonstrate interest or the intent to purchase such products. Additionally, unfamiliarity with the product that the brand represents may generate false brand attitudes. Since the sample did not include many musicians, the researcher could not develop strong assumptions from the data that link back to the LC4MP. Subjects could not encode information and create mental links if no previously encoded information about a brand existed. Future research should consider the product categories of the in-game brands and should attempt to use more mainstream, widely used brands to account for differences in product relevance in the study population.

Additional limitations include the use of the physiological measures to validate concentration. Although the physiological measures provide unbiased, concrete results, the movement of the subjects during the stimulus exposure could have created noise in the heart rate readings. The researcher considered as many precautions as possible to reduce noise in the readings, from placing two electrodes on the ankles instead of the wrists to instructing participants to reduce unnecessary movements. The researcher, however, observed no obvious errors in the heart rate data.



## **CHAPTER 7**

### **FUTURE RESEARCH**

As indicated in the study limitations, future research in in-game branding should consider the types of brands tested and the attributes of the subject pool to avoid potential issues with irrelevant products or brands. Yet at the same time, future research should consider the type of game used to test the effects of the game on brand recall. Guitar Hero ranks among the first category of games to allow gamers the opportunity to physically mimic the actions performed in the game with a replica of a real guitar. The Nintendo Wii gaming console also allows gamers to physically dictate the actions of video games beyond simply pressing buttons. As in-game advertising becomes more prominent in new gaming technology, future research should examine how the structure of the game affects variables like brand or ad recall.

The current research reveals a need for more in-game advertising in terms of physiological measures. The heart rate data generated a wealth of information that provided a new way of thinking about physiological reactions to video games. Perhaps some types of video games elicit more excited physiological responses, while other types of games generate more of a physiological response for concentration. Future research should explore physiological reactions and active versus passive gaming, such as a game like Guitar Hero in which the gamer actively engages in game play versus a traditional controller video game or computer game. Such a study could provide information on the level of arousal or excitement that players experience when playing different types of games.

Future research should also examine the effects of in-game branding on the level of the individual. Very little research considers the effects of gaming on both players and spectators. The rise in popularity of social, casual games like Guitar Hero call for more research on the differences between players and spectators, especially in terms of in-game advertising. If a game

like Guitar Hero attracts the attention of both players and spectators, perhaps a game of a different nature like a racing game or a golf game that requires attention from the player but not the spectator would elicit more brand recall from spectators in a social setting.

Additionally, as previously noted, future research should consider in-game brand recall in a longitudinal sense. Gamers will likely not recall many brands from exposure to an unfamiliar game over the course of one five-minute session. In reality, gamers purchase a game and play the video game repeatedly in an effort to finish the game. Exposure to in-game brands therefore occurs on a somewhat regular basis over a long period of time. Longitudinal research on in-game brand recall would allow researchers to study brand recall in a more realistic context.

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## APPENDIX A SURVEY FREQUENCIES

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### Demographic Information (N = 210)

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#### Gender

Male	95 (45.2%)
Female	115 (54.8%)

Age	18	19	20	21	22	23	24	25	26+
	21	34	26	34	17	17	22	18	18
	(10%)	(16.2%)	(12.4%)	(16.2%)	(8.1%)	(8.1%)	(10.5%)	(8.6%)	(8.6%)

#### How long have you been playing video games?

Don't play	Less than 1 year	1-2 years	3-5 years	6-8 years	9 + years
41 (19.5%)	6 (2.9%)	12 (5.7%)	13 (6.2%)	19 (9%)	118 (56.2%)

#### How often do you play video games?

Once a year or less	Once a month or less	Once a week or less	3-5 times a week	Every day
40 (19%)	60 (28.6%)	46 (21.9%)	40 (19%)	24 (11.4%)

#### How many hours do you spend per week playing video games?

0 hours	1-5 hours	6-10 hours	11-15 hours	16-20 hours	21-25 hours	25+ hours
75 (35.7%)	87 (41.4%)	22 (10.5%)	7 (3.3%)	11 (5.2%)	2 (1%)	5 (2.4%)

#### Rate your level of experience with Guitar Hero III:

No Experience	Beginner	Intermediate	Advanced	Expert
53 (25.2%)	70 (33.3%)	42 (20%)	16 (7.6%)	29 (13.8%)

#### Rate your level of experience with the following instruments:

Instrument	No Experience	Beginner	Intermediate	Advanced	Expert
Guitar	113 (53.8%)	66 (31.4%)	18 (8.6%)	10 (4.8%)	3 (1.4%)
Bass Guitar	162 (77.1%)	25 (11.9%)	13 (6.2%)	10 (4.8%)	0
Drums	156 (74.3%)	37 (17.6%)	11 (5.2%)	5 (2.4%)	0
Keyboard	113 (53.8%)	60 (28.6%)	24 (11.4%)	9 (4.3%)	3 (1.4%)

#### I consider myself knowledgeable about the gaming industry.

1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
46 (21.9%)	49 (23.3%)	25 (11.9%)	24 (11.4%)	22 (10.5%)	28 (13.3%)	16 (7.6%)

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<b>I enjoy playing video games.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
14 (6.7%)	14 (6.7%)	23 (11%)	24 (11.4%)	44 (21%)	40 (19%)	51 (24.3%)
<b>I am willing to pay \$50-\$60 for a video game.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
72 (34.3%)	25 (11.9%)	27 (12.9%)	28 (13.3%)	25 (11.9%)	19 (9%)	14 (6.7%)

<b>Game Review (N = 122)</b>						
<b>This game was:</b>						
1 – Bad	2	3	4	5	6	7 – Good
2 (1%)	3 (1.4%)	9 (4.3%)	16 (7.6%)	22 (10.5%)	26 (12.4%)	44 (21%)
1 – Boring	2	3	4	5	6	7 – Fun
3 (1.4%)	6 (2.9%)	4 (1.9%)	8 (3.8%)	22 (10.5%)	32 (15.2%)	47 (22.4%)
1 – Undesirable	2	3	4	5	6	7 – Desirable
2 (1.6%)	9 (7.4%)	7 (5.7%)	12 (9.8%)	23 (18.9%)	28 (23%)	41 (33.6%)
<b>My feelings toward this game are feelings of:</b>						
1 – Like	2	3	4	5	6	7 – Dislike
2 (1%)	5 (2.4%)	7 (3.3%)	13 (6.2%)	18 (8.6%)	30 (14.3%)	47 (22.4%)
<b>I am interested in playing a “real” guitar.</b>						
1 – Disagree	2	3	4	5	6	7 – Agree
30 (14.3%)	19 (9%)	27 (12.9%)	27 (12.9%)	38 (18.1%)	23 (11%)	45 (21.4%)
<b>I am interested in the rock n’ roll music genre.</b>						
1 – Disagree	2	3	4	5	6	7 – Agree
9 (4.3%)	8 (3.8%)	11 (5.2%)	17 (8.1%)	41 (19.5%)	51 (24.3%)	73 (34.8%)

<b>Attitudes Towards Advertising and In-Game Advertising (N = 210)</b>						
<b>Advertising in general is annoying/obtrusive to me.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
9 (4.3%)	29 (13.8%)	37 (17.6%)	53 (25.2%)	43 (20.5%)	22 (10.5%)	15 (7.1%)
<b>Advertising/product placement in movies is annoying/obtrusive to me.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
13 (6.2%)	36 (17.1%)	27 (12.9%)	46 (21.9%)	44 (21%)	27 (12.9%)	14 (6.7%)



<b>Advertising/product placement in television is annoying/obtrusive to me.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
13 (6.2%)	33 (15.7%)	35 (16.7%)	49 (23.3%)	40 (19%)	28 (13.3%)	10 (4.8%)
<b>Advertising provides me with valuable information.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
11 (5.2%)	26 (12.4%)	43 (20.5%)	57 (27.1%)	42 (20%)	19 (9%)	10 (4.8%)
<b>I enjoy advertisements for products that pertain to me.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
6 (2.9%)	24 (11.4%)	26 (12.4%)	49 (23.3%)	41 (19.5%)	44 (21%)	18 (8.6%)
<b>Advertising/product placement in video games is annoying/obtrusive to me.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
17 (8.1%)	23 (11%)	25 (11.9%)	67 (31.9%)	42 (20%)	22 (10.5%)	14 (6.7%)
<b>I hate seeing brand name products in games if they are placed for commercial purposes.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
17 (8.1%)	24 (11.4%)	30 (14.3%)	56 (26.7%)	34 (16.2%)	34 (16.2%)	15 (7.1%)
<b>I do not mind seeing brand name products in games as long as they are not unrealistically shown.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
3 (1.4%)	5 (2.4%)	23 (11%)	56 (26.7%)	50 (23.8%)	46 (21.9%)	27 (12.9%)
<b>The presence of brand name products in game makes it more realistic.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
8 (3.8%)	23 (11%)	23 (11%)	54 (25.7%)	40 (19%)	40 (19%)	20 (9.5%)
<b>I generally prefer games that do not have product placements in them to those that do.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
7 (3.3%)	18 (8.6%)	26 (12.4%)	109 (51.9%)	25 (11.9%)	13 (6.2%)	12 (5.7%)
<b>I don't mind if brand name products appear in games.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
4 (1.9%)	12 (5.7%)	22 (10.5%)	57 (27.1%)	33 (15.7%)	43 (20.5%)	39 (18.6%)

<b>I would welcome advertising in video games if the retail price dropped by \$10 because of advertising included in the game.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
4 (1.9%)	12 (5.7%)	15 (7.1%)	30 (14.3%)	50 (23.8%)	41 (19.5%)	56 (26.7%)
<b>I would welcome advertising in video games if the retail price dropped by \$20 because of advertising included in the game.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
5 (2.4%)	6 (2.9%)	7 (3.3%)	25 (11.9%)	34 (16.2%)	44 (21%)	89 (42.4%)
<b>I would pay more for an advertising-free version of a video game that I was interested in.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
18 (8.6%)	14 (6.7%)	19 (9%)	44 (21%)	26 (12.4%)	32 (15.2%)	56 (26.7%)
<b>Product placements in games make me want to buy the products.</b>						
1 – Strongly Disagree	2	3	4	5	6	7 – Strongly Agree
68 (32.4%)	58 (27.6%)	32 (15.2%)	39 (18.6%)	10 (4.8%)	1 (.5%)	2 (1%)

<b>Aided Recall (N = 122)</b>		
Brand	Yes	No
Axe	27 (12.9%)	95 (45.2%)
Gibson	70 (33.3%)	52 (24.8%)
Line 6	30 (14.3%)	89 (42.4%)
Mackie	16 (7.6%)	104 (49.5%)
Pontiac	30 (14.3%)	91 (43.3%)
Zildijan	42 (20%)	80 (38.1%)

<b>Unaided Recall (N = 122)</b>		
Brand	Yes	No
Axe	9 (4.3%)	113 (53.8%)
Gibson	18 (8.6%)	104 (49.5%)
Line 6	5 (2.4%)	117 (55.7%)
Mackie	0	122 (100%)
Pontiac	14 (6.7%)	108 (51.4%)
Zildijan	1 (.5%)	121 (57.6%)

<b>Brand Questions (N = 210)</b>							
<b>What product category carries this brand name?</b>							
Brand	Musical Instruments	Video Equipment	Automobiles	Sound Equipment			
Pontiac	5 (2.4%)	16 (7.6%)	185 (88.1%)	3 (1.4%)			
Brand	Computers	Sound Equipment	Toiletries & Hygiene	Musical Instruments	Clothing		
Line 6	8 (3.8%)	123 (58.6%)	3 (1.4%)	40 (19%)	32 (15.2%)		
Brand	Video Equipment	Toiletries & Hygiene	Sound Equipment	Musical Instruments	Music Retail Store		
Axe	2 (1%)	202 (96.2%)	2 (1%)	3 (1.4%)	1 (.5%)		
Brand	Food & Beverage	Sound Equipment	Video Equipment	Toiletries & Hygiene	Musical Instruments		
Mackie	14 (6.7%)	89 (42.4%)	73 (34.8%)	1 (.5%)	30 (14.3%)		
Brand	Food & Beverage	Clothing	Sound Equipment	Musical Instruments	Video Equipment		
Zildjian	10 (4.8%)	24 (11.4%)	18 (8.6%)	143 (68.1%)	14 (6.7%)		
Brand	Automobiles	Music Retail	Sound Equipment	Musical Instruments	Video Equipment		
Gibson	2 (1%)	19 (9%)	14 (6.7%)	168 (80%)	7 (3.3%)		
<b>This brand belongs in Guitar Hero III.</b>							
Brand	1-Strongly Disagree	2	3	4	5	6	7-Strongly Agree
Pontiac	95 (45.2%)	37 (17.6%)	27 (12.9%)	40 (19%)	9 (4.3%)	1 (.5%)	1 (.5%)
Line 6	28 (13.3%)	21 (10%)	18 (8.6%)	66 (31.4%)	28 (13.3%)	23 (11%)	24 (11.4%)
Axe	79 (37.6%)	51 (24.3%)	24 (11.4%)	31 (14.8%)	15 (7.1%)	6 (2.9%)	3 (1.4%)
Mackie	39 (18.6%)	23 (11%)	21 (10%)	72 (34.3%)	27 (12.9%)	13 (6.2%)	13 (6.2%)
Zildjian	15 (7.1%)	9 (4.3%)	10 (4.8%)	47 (22.4%)	29 (13.8%)	26 (12.4%)	71 (33.8%)
Gibson	7 (3.3%)	5 (2.4%)	4 (1.9%)	22 (10.5%)	16 (7.6%)	30 (14.3%)	124 (59%)
<b>I have seen an advertisement for this product in the past:</b>							

Brand	Never	Week	Month	Year	Two Years +
Pontiac	103 (49%)	46 (21.9%)	38 (18.1%)	18 (8.6%)	5 (2.4%)
Line 6	171 (81.4%)	12 (5.7%)	10 (4.8%)	9 (4.3%)	7 (3.3%)
Axe	5 (2.4%)	141 (67.1%)	53 (25.2%)	6 (2.9%)	5 (2.4%)
Mackie	188 (89.5%)	2 (1%)	3 (1.4%)	9 (4.3%)	5 (2.4%)
Zildijan	130 (61.9%)	14 (6.7%)	17 (8.1%)	35 (16.7%)	13 (6.2%)
Gibson	74 (35.2%)	31 (14.8%)	32 (15.2%)	46 (21.9%)	27 (12.9%)

#### How interested are you in the brand?

Brand	Very Interested	Interested	Neutral	Somewhat Interested	Not at all Interested
Pontiac	0	2 (1%)	60 (28.6%)	7 (3.3%)	141 (67.1%)
Line 6	1 (.5%)	11 (5.2%)	52 (24.8%)	15 (7.1%)	128 (61%)
Axe	7 (3.3%)	43 (20.5%)	61 (29%)	23 (11%)	75 (35.7%)
Mackie	4 (1.9%)	5 (2.4%)	61 (29%)	8 (3.8%)	130 (61.9%)
Zildijan	5 (2.4%)	27 (12.9%)	55 (26.2%)	21 (10%)	100 (47.6%)
Gibson	26 (12.4%)	42 (20%)	45 (21.4%)	32 (15.2%)	65 (31%)

#### How likely are you to purchase a [brand] product in the future?

Brand	Very Likely	Somewhat Likely	Neutral	Unlikely	Very Unlikely
Pontiac	0	2 (1%)	22 (10.5%)	28 (13.3%)	157 (74.8%)
Line 6	1 (.5%)	7 (3.3%)	34 (16.2%)	26 (12.4%)	141 (67.1%)
Axe	17 (8.1%)	45 (21.4%)	23 (11%)	31 (14.8%)	94 (44.8%)
Mackie	2 (1%)	4 (1.9%)	40 (19%)	25 (11.9%)	137 (65.2%)
Zildijan	3 (1.4%)	9 (4.3%)	33 (15.7%)	32 (15.2%)	129 (61.4%)
Gibson	6 (2.9%)	32 (15.2%)	33 (15.7%)	41 (19.5%)	98 (46.7%)

#### The [brand] is:

Brand	1-Unappealing	2	3	4	5	6	7- Appealing
Pontiac	30 (14.3%)	33 (15.7%)	27 (12.9%)	86 (41%)	29 (13.8%)	4 (1.9%)	1 (.5%)
Line 6	18 (8.6%)	8 (3.8%)	14 (6.7%)	139 (66.2%)	17 (8.1%)	6 (2.9%)	4 (1.9%)
Axe	20 (9.5%)	10 (4.8%)	14 (6.7%)	44 (21%)	45 (21.4%)	50 (23.8%)	27 (12.9%)
Mackie	20 (9.5%)	15 (7.1%)	15 (7.1%)	137 (65.2%)	11 (5.2%)	7 (3.3%)	1 (.5%)
Zildijan	14 (6.7%)	4 (1.9%)	10 (4.8%)	73 (34.8%)	46 (21.9%)	30 (14.3%)	30 (14.3%)

Gibson	7 (3.3%)	4 (1.9%)	5 (2.4%)	37 (17.6%)	31 (14.8%)	47 (22.4%)	78 (37.1%)
Brand	1-Uncool	2	3	4	5	6	7-Cool
Pontiac	23 (11%)	35 (16.7%)	32 (15.2%)	91 (43.3%)	24 (11.4%)	5 (2.4%)	0
Line 6	11 (5.2%)	11 (5.2%)	14 (6.7%)	145 (69%)	1 (7.6%)	7 (3.3%)	4 (1.9%)
Axe	14 (6.7%)	10 (4.8%)	15 (7.1%)	50 (23.8%)	55 (26.2%)	48 (22.9%)	18 (8.6%)
Mackie	18 (8.6%)	14 (6.7%)	18 (8.6%)	138 (65.7%)	13 (6.2%)	6 (2.9%)	0
Zildjian	12 (5.7%)	5 (2.4%)	11 (5.2%)	72 (34.3%)	43 (20.5%)	35 (16.7%)	31 (14.8%)
Gibson	7 (3.3%)	5 (2.4%)	6 (2.9%)	37 (17.6%)	25 (11.9%)	56 (26.7%)	74 (35.2%)

**The [brand] fits the Guitar Hero (experiment)/rock n' roll (control) lifestyle.**

Brand	1- Strongly Disagree	2	3	4	5	6	7-Strongly Agree
Pontiac	51 (24.3%)	34 (16.2%)	33 (15.7%)	72 (34.3%)	14 (6.7%)	6 (2.9%)	0
Line 6	11 (5.2%)	10 (4.8%)	18 (8.6%)	112 (53.3%)	24 (11.4%)	20 (9.5%)	13 (6.2%)
Axe	17 (8.1%)	27 (12.9%)	26 (12.4%)	51 (24.3%)	51 (24.3%)	19 (9%)	18 (8.6%)
Mackie	16 (7.6%)	13 (6.2%)	15 (7.1%)	119 (56.7%)	24 (11.4%)	11 (5.2%)	9 (4.3%)
Zildjian	12 (5.7%)	5 (2.4%)	10 (4.8%)	59 (28.1%)	32 (15.2%)	36 (17.1%)	54 (25.7%)
Gibson	6 (2.9%)	4 (1.9%)	4 (1.9%)	27 (12.9%)	25 (11.9%)	34 (16.2%)	109 (51.9%)

**I believe that musicians use [brand] products.**

Brand	1- Strongly Disagree	2	3	4	5	6	7-Strongly Agree
Pontiac	58 (27.6%)	43 (20.5%)	30 (14.3%)	67 (31.9%)	10 (4.8%)	2 (1%)	0
Line 6	10 (4.8%)	12 (5.7%)	17 (8.1%)	97 (46.2%)	28 (13.3%)	20 (9.5%)	23 (11%)
Axe	14 (6.7%)	23 (11%)	19 (9%)	68 (32.4%)	47 (22.4%)	23 (11%)	16 (7.6%)
Mackie	17	16	13 (6.2%)	111	24	13 (6.2%)	11 (5.2%)

	(8.1%)	(7.6%)		(52.9%)	(11.4%)		
Zildjian	14 (6.7%)	6 (2.9%)	5 (2.4%)	58 (27.6%)	23 (11%)	26 (12.4%)	77 (36.7%)
Gibson	6 (2.9%)	6 (2.9%)	4 (1.9%)	23 (11%)	15 (7.1%)	24 (11.4%)	132 (62.9%)
<b>I feel more positive about [brand] after seeing it in Guitar Hero III. (experiment only)</b>							
Brand	1- Strongly Disagree	2	3	4	5	6	7-Strongly Agree
Pontiac	47 (22.4%)	21 (10%)	19 (9%)	30 (14.3%)	4 (1.9%)	1 (.5%)	0
Line 6	22 (10.5%)	13 (6.2%)	12 (5.7%)	56 (26.7%)	15 (7.1%)	2 (1%)	0
Axe	24 (11.4%)	22 (10.5%)	15 (7.1%)	43 (20.5%)	12 (5.7%)	4 (1.9%)	2 (1%)
Mackie	29 (13.8%)	7 (3.3%)	15 (7.1%)	60 (28.6%)	10 (4.8%)	1 (.5%)	0
Zildjian	23 (11%)	9 (4.3%)	7 (3.3%)	49 (23.3%)	18 (8.6%)	9 (4.3%)	4 (1.9%)
Gibson	19 (9%)	6 (2.9%)	13 (6.2%)	42 (20%)	17 (8.1%)	11 (5.2%)	14 (6.7%)

## **APPENDIX B**

### **SCRIPT FOR EXPERIMENT SESSION**

Thank you for coming today. This is an experiment about Guitar Hero and what is going on inside and outside while you are playing the game. Part of the experiment involves hooking you up to this heart rate monitor. The monitor is similar to the machines used in hospitals. I am going to put an electrode on your left wrist and on the inside of your left and right ankles. You will not feel anything while you are hooked up to the machine. Before I place the electrode on you, I am going to brush the contact area lightly with an abrasive pad to remove dead skin cells that might impede the connection. Once I hook everyone up, one of you will play and the rest of you will watch one song in *Guitar Hero*. I have already chosen the song, and the level is on medium. If you fail the song, keep restarting until I tell you to stop. Once you are finished with the game, I will assign you to a computer to take a survey. Does anyone have any questions about the heart rate equipment or the procedure before we begin?

This was an experiment about the advertisements in *Guitar Hero*. I was trying to find how differences in gamer experience, difficulty of the game, and whether playing or watching affects what you remembered from the game. Each brand that you answered a series of questions about in the survey was in the video game in some form. I measured heart rate to determine how much you were concentrating on the game because a decreased heart rate indicates concentration. Do you have any questions about the experiment? Thank you for your participation.

## APPENDIX C CONSENT FORM (EXPERIMENT)

Please return to the experiment moderator and keep a copy for yourself.

*Study Title:* Playing Like a Rock Star: Evaluating Active Gameplay in *Guitar Hero III*

*Performance site:* Louisiana State University Agricultural and Mechanical College

*Investigators:* The following investigator is available for questions about this study  
M-F, 8:00am – 4:30 pm: Miranda Lemon, (504) 258-1537, [mlemon1@lsu.edu](mailto:mlemon1@lsu.edu)

*Purpose of the study:* The goal of this project is to determine how controlling a guitar video game with an actual guitar controller rather than a traditional video game controller affects heart rate and cognition during gameplay.

*Number of subjects:* 200

*Study procedures:* The researcher will first orally brief participants on the purpose of the BIOPAC equipment. The BIOPAC equipment will be used to measure heart rate in participants during stimulus exposure. The researcher will then attach consenting experiment participants to the BIOPAC machine via electrodes placed on the left wrist and on the inner side of the left and right ankles through adhesive patches. Before attaching the adhesive patch, the researcher will lightly brush the contact area with a mildly abrasive pad to remove dead skin cells or other matter that may inhibit data collection. The use of BIOPAC equipment poses no more than minimal risk of harm to subjects. Subjects may decline participation at any time.

Subjects will participate in stimulus exposure in groups of 3 or 4, with one participant playing the *Guitar Hero III* video game and one to three participants watching the video game. After exposure to the stimulus, the researcher will instruct participants to remove the adhesive pads. The researcher will then administer a post-survey that measures several variables. The survey will ask no personal information of participants, but the researcher will ask for participants' names in order to keep track of participation for extra credit in class. All names will be stored on a server in a locked room with administrator access only. After completing the survey, the researcher will debrief experiment participants.

*Benefits:* Study participants will benefit the academic community by participating in research designed to further research in video gaming.

*Risks:* This study poses no immediate risks to participants. This study will exclude pregnant women.

*Right to refuse:* Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.



*Privacy:* Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

*Signatures:*

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Matthews, Institutional Review Board, (225) 578-8692. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

Signature of subject: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX D EXPERIMENT INSTRUMENT

### Demographic Information

Male                      Female

Age: \_\_\_\_\_

How long have you been playing video games?

I don't play video games

Less than one year

1-2 years

3-5 years

6-8 years

9 years or more

What gaming console(s) (if any) do you own?

How often do you play video games?

Once a year or less

Once a month or less

Once a week or less

3-5 times a week

Every day

How many hours do you spend per week playing video games?

0 hours

1-5 hours

6-10 hours

11-15 hours

16-20 hours

21-25 hours

25+ hours

Rate your level of experience with *Guitar Hero III*:

No experience	Beginner	Intermediate	Advanced	Expert
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Rate your level of experience with playing the guitar:

No experience	Beginner	Intermediate	Advanced	Expert
---------------	----------	--------------	----------	--------

Rate your level of experience with playing the bass guitar:

No experience	Beginner	Intermediate	Advanced	Expert
---------------	----------	--------------	----------	--------

Rate your level of experience with playing the drums:

No experience	Beginner	Intermediate	Advanced	Expert
---------------	----------	--------------	----------	--------

Rate your level of experience with playing the keyboard:

No experience	Beginner	Intermediate	Advanced	Expert
---------------	----------	--------------	----------	--------

I consider myself knowledgeable about the gaming industry (1-strongly disagree, 7-strongly agree)

I enjoy playing video games (1-strongly disagree, 7-strongly agree)

I am willing to pay \$50-\$60 for a video game (1-strongly disagree, 7-strongly agree)

Name any brands or products that you remember seeing in the game.

Do you use or regularly buy any of the brands that you remember seeing in the game? If so, which?

#### Survey Questions

##### *Guitar Hero III*

This game was (1-bad, 7-good)

This game was (1-boring, 7-fun)

My feelings toward this game are feelings of (1-dislike, 7-like)

This game was (1-undesirable, 7-desirable)

I am interested in playing a “real” guitar (1-disagree, 7-agree)

I am interested in the rock n’ roll music genre (1-disagree, 7-agree)

Please answer the following questions by rating your answers as 1- strongly disagree and 7-strongly agree

Advertising in general is annoying/obtrusive to me.

Advertising/product placement in movies is annoying/obtrusive to me.

Advertising/product placement in TV shows is annoying/obtrusive to me.

Advertising provides me with valuable information

I enjoy advertisements for products that pertain to me

Advertising/product placement in video games is annoying/obtrusive to me.

I hate seeing brand name products in games if they are placed for commercial purposes.

I do not mind seeing brand name products in games as long as they are not unrealistically shown

The presence of brand name products in a game makes it more realistic

I generally prefer games that do not have product placements in them to those that do

I don't mind if brand name products appear in games

I would welcome advertising in video games if the retail price dropped by \$10 because of advertising included in the game.

I would welcome advertising in video games if the retail price dropped by \$20 because of advertising included in the game.

I would pay more for an advertising-free version of a video game that I was interested in.

Product placements in games make me want to buy the products

Which brands appeared in the gaming experience?





What product category carries this brand name?

- Music equipment
- Food & Beverage
- Automobiles
- Clothing
- Video equipment

This brand belongs in *Guitar Hero III* (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in the Pontiac Garage?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Pontiac product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Pontiac brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Pontiac brand fits the *Guitar Hero III* lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Pontiac products (1-strongly disagree, 7-strongly agree)

I feel more positive about Pontiac after seeing it in the game (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Music equipment
- Food & Beverage
- Computers
- Music retail store
- Video equipment

This brand belongs in *Guitar Hero III* (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in the Line 6?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Line 6 product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Line 6 brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Line 6 brand fits the *Guitar Hero III* lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Line 6 products (1-strongly disagree, 7-strongly agree)

I feel more positive about Line 6 after seeing it in the game (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Music Equipment
- Computers
- Toiletries & Hygiene
- Clothing
- Video equipment

This brand belongs in *Guitar Hero III* (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Axe?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase an Axe product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Axe brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Axe brand fits the *Guitar Hero III* lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Axe products (1-strongly disagree, 7-strongly agree)

I feel more positive about Axe after seeing it in the game (1-strongly disagree, 7-strongly agree)



# MACKIE.

What product category carries this brand name?

- Computers
- Music Equipment
- Automobiles
- Clothing
- Video equipment

This brand belongs in *Guitar Hero III* (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Mackie?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Mackie product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Mackie brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Mackie brand fits the *Guitar Hero III* lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Mackie products (1-strongly disagree, 7-strongly agree)

I feel more positive about Mackie after seeing it in the game (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Computers
- Music Equipment
- Automobiles
- Clothing
- Video equipment

This brand belongs in *Guitar Hero III* (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Zildjian?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Zildjian product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Zildjian brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Zildjian brand fits the *Guitar Hero III* lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Zildjian products (1-strongly disagree, 7-strongly agree)

I feel more positive about Zildjian after seeing it in the game (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Computers
- Music Equipment
- Automobiles
- Food & Beverage
- Video equipment

This brand belongs in *Guitar Hero III* (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Gibson?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Gibson product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Gibson brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Gibson brand fits the *Guitar Hero III* lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Gibson products (1-strongly disagree, 7-strongly agree)

I feel more positive about Gibson after seeing it in the game (1-strongly disagree, 7-strongly agree)

## APPENDIX E CONSENT FORM (ONLINE)

Please print a copy of this page for your records.

*Study Title:* Playing Like a Rock Star: Evaluating Active Gameplay in *Guitar Hero III*

*Performance site:* Louisiana State University Agricultural and Mechanical College

*Investigators:* The following investigator is available for questions about this study  
M-F, 8:00am – 4:30 pm: Miranda Lemon, (504) 258-1537, mlemon1@lsu.edu

*Purpose of the study:* The goal of this project is to determine how controlling a guitar video game with an actual guitar controller rather than a traditional video game controller affects heart rate and cognition during gameplay.

*Number of subjects:* 200

*Study procedures:* Participants will complete a 20-minute survey of their perceptions of the *Guitar Hero III* video game.

*Benefits:* Study participants will benefit the academic community by participating in research designed to further research in video gaming.

*Risks:* This study poses no immediate risks to participants.

*Right to refuse:* Subjects may choose not to participate or to withdraw from the study at any time without penalty or loss of any benefit to which they might otherwise be entitled.

*Privacy:* Results of the study may be published, but no names or identifying information will be included in the publication. Subject identity will remain confidential unless disclosure is required by law.

*Signatures:*

The study has been discussed with me and all my questions have been answered. I may direct additional questions regarding study specifics to the investigators. If I have questions about subjects' rights or other concerns, I can contact Robert C. Matthews, Institutional Review Board, (225) 578-8692. I agree to participate in the study described above and acknowledge the investigator's obligation to provide me with a signed copy of this consent form.

I agree to the conditions of this survey:                      Yes                      No

## APPENDIX F ONLINE INSTRUMENT

### Demographic Information

Male                  Female

Age: \_\_\_\_\_

How long have you been playing video games?

I don't play video games

Less than one year

1-2 years

3-5 years

6-8 years

9 years or more

What gaming console(s) (if any) do you own?

How often do you play video games?

Once a year or less

Once a month or less

Once a week or less

3-5 times a week

Every day

How many hours do you spend per week playing video games?

0 hours

1-5 hours

6-10 hours

11-15 hours

16-20 hours

21-25 hours

25+ hours

Rate your level of experience with *Guitar Hero III*:

No experience	Beginner	Intermediate	Advanced	Expert
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Rate your level of experience with playing the guitar:

No experience	Beginner	Intermediate	Advanced	Expert
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Rate your level of experience with playing the bass guitar:

No experience	Beginner	Intermediate	Advanced	Expert
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Rate your level of experience with playing the drums:

No experience	Beginner	Intermediate	Advanced	Expert
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Rate your level of experience with playing the keyboard:

No experience	Beginner	Intermediate	Advanced	Expert
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I consider myself knowledgeable about the gaming industry (1-strongly disagree, 7-strongly agree)

I enjoy playing video games (1-strongly disagree, 7-strongly agree)

I am willing to pay \$50-\$60 for a video game (1-strongly disagree, 7-strongly agree)

#### Survey Questions

I am interested in playing a “real” guitar (1-disagree, 7-agree)

I am interested in the rock n’ roll music genre (1-disagree, 7-agree)

Please answer the following questions by rating your answers as 1- strongly disagree and 7-strongly agree

Advertising in general is annoying/obtrusive to me.

Advertising/product placement in movies is annoying/obtrusive to me.

Advertising/product placement in TV shows is annoying/obtrusive to me.

Advertising provides me with valuable information

I enjoy advertisements for products that pertain to me

Advertising/product placement in video games is annoying/obtrusive to me.

I hate seeing brand name products in games if they are placed for commercial purposes.

I do not mind seeing brand name products in games as long as they are not unrealistically shown

The presence of brand name products in a game makes it more realistic

I generally prefer games that do not have product placements in them to those that do

I don’t mind if brand name products appear in games

I would welcome advertising in video games if the retail price dropped by \$10 because of advertising included in the game.

I would welcome advertising in video games if the retail price dropped by \$20 because of advertising included in the game.

I would pay more for an advertising-free version of a video game that I was interested in.

Product placements in games make me want to buy the products.



What product category carries this brand name?

- Music equipment
- Food & Beverage
- Automobiles
- Clothing
- Video equipment

This brand makes me think of music (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in the Pontiac Garage?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Pontiac product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Pontiac brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Pontiac brand fits the *Guitar Hero* III lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Pontiac products (1-strongly disagree, 7-strongly agree)





What product category carries this brand name?

- Music equipment
- Food & Beverage
- Computers
- Music retail store
- Video equipment

This brand makes me think of music (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Line 6?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Line 6 product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Line 6 brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Line 6 brand fits the *Guitar Hero* III lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Line 6 products (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Music Equipment
- Computers
- Toiletries & Hygiene
- Clothing
- Video equipment

This brand makes me think of music (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Axe?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase an Axe product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Axe brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Axe brand fits the *Guitar Hero* III lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Axe products (1-strongly disagree, 7-strongly agree)

# **MACKIE.**

What product category carries this brand name?

- Computers
- Music Equipment
- Automobiles
- Clothing
- Video equipment

This brand makes me think of music (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Mackie?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Mackie product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Mackie brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Mackie brand fits the *Guitar Hero* III lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Mackie products (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Computers
- Music Equipment
- Automobiles
- Clothing
- Video equipment

This brand makes me think of music (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Zildjian?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Zildjian product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Zildjian brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Zildjian brand fits the *Guitar Hero* III lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Zildjian products (1-strongly disagree, 7-strongly agree)



What product category carries this brand name?

- Computers
- Music Equipment
- Automobiles
- Food & Beverage
- Video equipment

This brand makes me think of music (1- strongly disagree, 7- strongly agree)

I have seen an advertisement for this product in the past:

- Never
- Week
- Month
- Year
- Two Years +

How interested are you in Gibson?

- Very interested
- Interested
- Somewhat interested
- Not at all interested

How likely are you to purchase a Gibson product in the near future?

- Very likely
- Somewhat likely
- Neutral
- Unlikely
- Very unlikely

The Gibson brand is

- Unappealing-1; Appealing-7
- Cool- 1; Uncool- 7

The Gibson brand fits the *Guitar Hero* III lifestyle (1-strongly disagree, 7-strongly agree)

I believe that musicians use Gibson products (1-strongly disagree, 7-strongly agree)

## VITA

Miranda Lemon, a native of Metairie, Louisiana, began her undergraduate career at Louisiana State University in graphic design. Upon reaching graduation in 2006, she decided to further her education by combining her knowledge of art and design with the strategy of advertising. Miranda began her graduate studies in advertising at the Manship School of Mass Communication in the fall of 2006.

Throughout graduate school, Miranda combined her interests in visual communication and technology in unconventional ways with topics like political campaigns and branding. She analyzed student attitudes towards the new Louisiana State University visual identity and examined how presidential candidates use the principles of branding to craft public images. The opportunity to write a thesis on *Guitar Hero* allowed Miranda to explore the up-and-coming medium of in-game advertising while having fun with research.

Miranda will assume the position of Marketing Generalist at the Amedisys corporate headquarters in Baton Rouge in May 2008, where she hopes to learn about advertising in the health care market.