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Religious consumption: Inside the minds of Apple and Catholic devotees

Yi-Chia Wu
University of Texas-Pan American

RELIGIOUS CONSUMPTION:

INSIDE THE MINDS OF APPLE AND CATHOLIC DEVOTEES

A Dissertation

by

YI-CHIA WU

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COMMITTEE MEMBERS

Dr. Michael S. Minor
Chair of Committee

Dr. A. Fuat Firat
Committee Member

Dr. Reto Felix
Committee Member

Dr. Teofilo Ozuna
Committee Member

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ABSTRACT

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Cult-like phenomena have been researched widely in the fields of marketing, religion, sociology, and—more recently—in the field of neuroscience. The exploration between individuals and brands through these lenses begins to offer glimpses into the relationship between brands and their devotees. Religion, a multidimensional influence on human behavior and decision-making, has been under-researched in the marketing discipline, possibly due to the sensitivity of religious topics and difficulties in measuring the impact of so potentially broad a field as "religion." This research narrows the topic, begins filling in the gap in the religion-brand relationship, and explores what constitutes a cult-like allegiance to a brand, namely Apple, by examining subjects' relationship to the Apple brand, comparing response to stimuli by subjects who were "devotees" versus "indifferents" to Catholicism and to Apple. The author uses Ninian Smart's (1989) "Seven Dimensions of Religion" as a theoretical framework to develop scales of measurement.

Two studies were conducted in this research. Study 1 developed Catholic and Apple devotion scales with 708 subjects. Study 2 was an electroencephalography (EEG) experiment that tested the hypothesis with 60 participants. This research found that Catholic devotees

produced statistically significant higher Alpha wave changes than Catholic indifferents in Material, Narrative, and Legal dimensions. Interestingly, Apple devotees produced statistically significant lower Alpha waves than Apple indifferents in Material, Ritual, and Emotional dimensions. Apple devotees did not experience as much overall Alpha waves as Catholic devotees overall. Even though not all the dimensions were statistically different between Catholic (Apple) devotees and indifferents, Catholic devotees did have higher Alpha waves than indifferents overall, while Apple devotees did not trigger higher Alpha waves than indifferents. These results were consistent throughout the Seven Dimensions.

This research concludes that, based on the foundation of the Seven Dimensions of Religion, Apple devotees did not have transcendent feelings towards Apple. Therefore, Apple cannot be considered a religion that triggers the feeling of the divine. The findings can be used as a foundation for business applications. The last section of this research elaborates on theoretical and practical implications and identifies new questions for future research.

DEDICATION

The completion of my doctoral degree would not have been possible without the love and support of my family. My husband, Joshua J. Wallace, whose name should have been co-listed on this degree, was always very supportive with his wisdom and incredible patience. My mother, Chun-Mei Yang, my father, Yen-Ling Wu, my sister, Yi-Shan Wu, and my brother, Sheng-Han Wu, wholeheartedly inspired, motivated, and supported me in my pursuit of this degree. Thank you for your love and encouragement.

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Although she had to resign from the committee, Dr. Xiaojing Sheng provided very detailed comments and constructive suggestions to this dissertation in order to achieve publishable quality. Dr. Reto Felix took on responsibilities as a committee member on very short notice, but provided detailed comments that made this dissertation develop much further. Dr. Teofilo Ozuna provided detailed insights to improve this dissertation. All of their advice, input, and comments on my dissertation helped ensure the quality of my intellectual work. I am very

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I sincerely thank all of the survey and EEG participants. I appreciate the chance to talk to each EEG participant about how their religious beliefs impact their lives, which was private and personal, as well as their experiences using Apple products in an unfamiliar environment. Thank you for trusting me.

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CHAPTER I

INTRODUCTION

Researchers have been comparing the cult-like phenomenon of Apple, Inc. (hereafter "Apple") to a religion for over a decade (Belk and Tumbat 2005; Firmin et al. 2010; Lam 2001); however, a larger examination of the religious, and sometimes cultish, phenomena that occur between individuals and businesses or institutions is under-researched. Boome et al. (2011), in their BBC documentary, *Secrets of the Superbrands,* demonstrate that a group of "very religious" In the documentary, host Alex Riley interviews technology consumers to explore how and why some brands achieve quasi-religious status. Boome et al. documents the parallels between religion or religious experiences and how the Apple cult narrative unfolds. Parts of this comparison in academia and the media may originate from the secretive nature of Apple operations, which were hidden not only from its competitors but also from employees and customers (Lashinsky 2012). Additionally, Apple's outperformance of competitors has drawn much attention from academia and marketers trying to understand the successes of the "Cult of Apple." Other firms face difficulties replicating Apple's successful business model and co-founder and CEO Steve Jobs' unique pursuit of designed simplicity of use (Segall 2012).

Apple's own appreciation of itself as a corporation and religious experience emerged early: at Apple's first annual party in 1977, Steve Jobs dressed as Jesus Christ to represent

himself as the savior of Apple (Young 1988). The worshipful respect paid to Jobs was not enjoyed by other leaders in the company. According to Adam Lashinsky, author of *Inside Apple* (2012), whenever a request came directly from Jobs, everyone in the company had to finish that particular task, regardless of what else he or she was working on at that moment. No one would refuse Jobs' requests (Lashinsky 2012). This was not only the case within Apple. Jobs' charm was irresistible to his fans and Apple's partners, and it still continues after his death in 2011. Former CEO of Apple, John Sculley, once said, "It was almost as if there were magnetic fields, some spiritual force, mesmerizing people. Their eyes were dazed. Excitement showed on everyone's face. It was nearly a cult environment" (Levy 1994, p.142).

Outside of Apple, Jobs has been similarly portrayed by the media. The cover of the January 2010 edition of *The Economist* presented Jobs as Moses, introducing the iPad on his hand as if it were an object of religious veneration. *The Economist* cover powerfully showed that the cult of Apple had spread virally, exerting influence on consumers both virtually and physically. The blogosphere jokingly considered the iPad the Jesus Tablet. (The Economist, p.11)

Beyond media coverage, Apple itself has used multiple mechanisms and marketing techniques to appeal to its customers. The cult-like success of this computer firm deserves examination, particularly when its technology allows one to access and connect to others at will. Reaching out to another individual is not limited to time, space, or physical locations. Researching Apple's cult-like phenomenon at this point in time allows us to understand the impact of brand worship in a comparative way, now and in the future.

At this point, it is important to explore some key definitions. According to the *Bloomsbury Guide to Human Thought* (1993), *cult* has two identified meanings in English

religious and theological literature: first, an "intense worship of or devotion to a particular saint or deity, who is credited with miracle-working powers" or second, a neo-religious activity, "heterodox sect outside the mainstream churches, often with secret doctrine and worship."

In *Merriam-Webster's Collegiate Dictionary* (2012), religious-like *zeal* is equivalent to "eagerness and ardent interest in pursuit of something." Further, *American Heritage Roget's Thesaurus* (2013) defines a *devotee* as "a person who is ardently devoted to a particular subject or activity." Arruda-Filho et al. (2010) use devotee, or Apple Acolytes, to describe loyal Apple users. Fanatics and cultists are typically related to religious activities, whereas zealots, enthusiasts, and devotees are less associated with religion and politics; however, the latter group displays an unexplainable attraction toward what they are passionate about.

This study uses "devotees" for Apple and Catholics to represent those who adore and devote themselves to an organization that is considered worthy of investing their time and effort in, regardless of space, distance, negative image, or crisis occurring within Apple or their religious organizations.

On the individual level, Nelson (2006) defines *spirituality* as "the more experiential component of that relationship [with some ultimate being or reality], or more broadly to one's core values or search for meanings" (p. 407). In the 16th century, two denoted understandings of *religion* were widely accepted: "a particular system of faith and worship" and "the human reverential recognition of a higher or unseen power" (Paloutzian and Park 2013, p.26). The 21st century academic redefines religion restrictedly as "individual and corporate beliefs and practices dealing with our relationships with some ultimate being or reality and is distinguished from *spirituality*" (Nelson 2006). In other words, the word *religion* is now not only used within the spiritual context but also in non-spiritual contexts.

For example, the global advertising firm Young and Rubicam claimed that "brands are the new religion" and that "people turn to them for meaning" (Rossano 2010). Some argue that religion exists in the cultural context and varies within the shape of cultural influence at a specific point in time. If the ideology expressed by materialism can shape one's judgments, social acceptance, moral issues, and the motivation for pursuing happiness, then that specific ideology can possibly function and impact one's beliefs and further replace the importance and value of one's religion. More extremely, one may take that ideology as one's religion, rather than having an "actual religion" per se. For instance, religion is often used in daily dialogue. In Alexandre O. Philippe's documentary of *The People vs. George Lucas* (2011), devoted fans describe George Lucas as "God" because of his ability to create the incredible movie series, *Star Wars*. The same phenomenon applies to Trekkies participating in *Star Trek* annual conventions as crucial events in their lives (Nygard 1997).

Lam (2001) explains the relationship between humans and computers from the perspective of the cult of Macintosh, another Apple product. He posits that since there are unexplainable outcomes involving computers, it is likely that the actions of computers may be interpreted as a form of "magic." Apple offers products with various "magical" functions to satisfy the needs of consumers.

A cult-like phenomenon emerged among the Apple Macintosh brand community (Belk and Tumbat 2005; Kahney 2004) and was related to certain Apple products. Lam (2001) explores "cultists, fanatics, and zealots" occurring through the lens of Macintosh devotees to follow an "implicit" religion. Both the Apple Macintosh and the Newton brand communities are cult-like denominations of Apple products (Muñiz and Schau 2005).

Stahl (1999) suggests that the magical components link with computer technology as an implicit religion with a set of beliefs and rituals. The phrase *implicit religion* comes from Chalfant (1992) in describing an Alcoholics Anonymous (AA) meeting. AA group members often use the term *spiritual* to describe a higher power greater than themselves that aids their fight against addiction, since the purpose of these meetings is not to worship a specific religion. Chalfant (1992) makes a fundamental distinction between *spiritual* beliefs and *religion.* The emotional state of believing in a greater power is a type of spiritual belief that one can use to achieve a goal to overcome desire. The resulting empowerment is strong enough for one to believe that it is a spiritual force. However, the role that God plays is minimal. That the individual's spiritual empowerment is different from the AA group's spiritual belief is clearly expressed. Therefore, Chalfant (1992) uses implicit religion to describe "the presence of the sacred in a non-religious group" (p. 119). However, it is crucial to point out that in Chalfant's (1992) study, interviewees believed in that greater power, sometimes understanding it as God playing His role, and believe it is necessary for recovery.

Theoretical Rationale

The theoretical rationale of this current study lies in understanding how devotees view their beloved brand to analogize those views as a form of a religious belief. The idea of forming a cult-like following of brands and communities was initiated into marketing strategy during the 1980s (Koay and Eriksson 2006). At the beginning of the 20th century, comparisons and strategic analyses with the name of "cult brands" appeared in the literature (Berry 1992). As Constantin and Stoenescu (2014) explain, there is one main characteristic that cult brands have in common: "brands for which consumers developed such strong feelings need to be inspirational, remarkable, and relatable" (p. 124). The meaning of "relatable" in this context suggests a level

where an individual can express feelings of freedom and their allegiance to products or brands. Contributing to a cult-like brand community not only satisfies one's basic needs for belonging (Atkin 2004), but also allows one to express oneself to a platform as an "outlet for personal fulfillment" (Acosta and Asagayam 2010). Cult brands create a strong relationship "with a group cognitively initiated by individuals" (Acosta and Devasagayam 2010, p. 166). Such cult-like communities and their followers rely on tightly-bonded connections and share a sense of "satisfaction, accomplishment, belonging, and enlightenment" (Ragas and Bueno 2002, p. xxii – xxiii). Constantin and Stoenescu (2014) generalize their observations from the literature, giving examples of several cult brands such as Apple, Oprah Winfrey, Volkswagen Beetle, Harley-Davidson, *Star Trek*, and others.

Kozinets (2001) analyzes *Star Trek* fandom, whose devotion goes beyond entertainment. For its followers, *Star Trek*'s imaginative future worlds provide a venue of escape as well as a platform for cognitive sharing (Sirsi et al. 1996) through an actualization of their imagination. One enthusiastic *Star Trek* fan that Kozinets interviewed in 1995 made the following statement: "*Star Trek* is a philosophy that almost approaches a religion. That's what it is. It's replacing religion, for a lot of people" (p. 76).

To explain the formation of a cult-like following, Constantin and Stoenescu (2014) generated eight characteristics that cult brands share, which were identified in the books *The Power of Cult Branding*, written by Ragas and Bueno (2002), and *The Culting of Brands: When Customers Become True Believers* written by Atkin (2004) and compiled. To wit: 1) the brand enables individual differences in the way that "brand is different, but same enough." (*c.f.* Constantin and Stoenescu 2014); 2) cult brand leaders are risk takers and determined fighters (Koay and Eriksson 2006); 3) cult brands sell lifestyles (Ragas and Bueno 2002) for customers to

fulfill their dreams (Constantin and Stoenescu 2014); 4) cult brands not only satisfy a customer's needs but, more importantly, they must listen and integrate their customers' input (Ragas and Bueno 2002) in order to create evangelists among leading fandoms (Constantin and Stoenescu 2014); 5) and thus, supportive communities are formed to create a sense of belonging and remain authentic to create meanings of oneself (Atkin 2004); 6) cult brands are open and inclusive (Ragas and Bueno 2002); 7) cult brands embrace personal freedom and rebellion (Ragas and Bueno 2002); and 8) cult brands demonize the other to create justified credibility (Atkin 2004).

The commonly shared characteristics of cult brands do not mean they all have these eight qualities, but several of these qualities may be observed in describing the success of cult brands. Fiske (1989) pointed out that "commodities become icons of worship and rituals of exchanging money for goods become a secular equivalent of holy communion (sic)" (p. 306).

To understand how brands end up developing a cult-like following, it is helpful to explore the biological structure of the human brain. Alwitt (1985) demonstrates that, "It has been well established that patterns of brain activity are closely correlated with behavior and cognition" (*c.f.* Ohme et al. 2011, p. 61). Utilizing the techniques of neuroscience allows one to "better understand the extreme brand-focused devotion" (Belk and Tumbat, 2005) of a cult-like compassion toward a company, such as Apple, and might further explain the development of a religious belief. The theoretical rationale of this study contributes to the phenomenon of zeal, which transcends computer technology.

Starting from an individual's viewpoint specifically, Atkin (2004) explores the reasons individuals are attracted to various groups to "find their own," or, in other words, the need to belong. His interviewees from different cult brand communities explain the reason for becoming a cult member by saying they needed to find a community that would allow them to "become

themselves." (p. 16) Sometimes, these devotees are traditional religious devotees, such as those who belong to the Mormon Church. Atkin (2004) often uses "devotees" while discussing cult brands, but whether these individuals' devotion reaches the religious level is not discussed or measured in his qualitative interviews with various cult communities such as Mary Kay, Harley-Davidson, Apple, and others.

Apple, a profit-driven corporation, impacts its followers through products, brand image, and the presentation of a focused ideology. Apple's ultimate purpose is to cultivate commitment and loyalty from "super fans"—enough that they will not allow their beloved Apple products to fail. As Hyken (2009) points out in *The Cult of the Customer,* "between 60% and 80% of customers who describe themselves as satisfied do not go back to do more business with the company they are satisfied with" (p. 3), unless they have been cultivated to become evangelists. Hyken (2009) suggests that an individual or business operating as what he refers to as a "Cult of Amazement," can generate WOW experiences during the moment when customer loyalty is initiated and consequently the customer becomes evangelistic.

This study examines phenomena beyond the WOW experience, occurring after a loyal customer has become an evangelist of Apple and is in an ongoing relationship with Apple products that includes meanings derived from using them. The devotion of each evangelist promotes the survival of the organization or product to which he or she is devoted. According to Muñiz's decade-long study on brand communities (*c.f.* Walker 2004), members of brand communities can provide information needed for the survival and continuation of a product even when the product is discontinued, as with the Apple Newton product, whose adherents were included in his study. That product will be discussed shortly. Notably, Muñiz wrote of the

Newton community: “No matter what hardships you throw at these people, they figure out some way to get around it and persevere through it” (*c.f.* Walker 2004, p. 32).

Additionally, Beauregard and Paquette (2008) recruited fourteen Carmelite nuns who were scanned in an fMRI machine while recalling a mystical experience. Beauregard and Paquette (2008) concluded that there were significant patterns of brain activity when the fourteen Carmelite nuns recalled their experience with God’s summons (called a “mystical condition”) versus the recall of the most intense union with another human (the control condition). Their study shows that a distant Alpha band emerges in the right hemisphere between the right frontal and parietal regions when recalling mystical experiences (vs. the control condition). This is consistent with research showing that the insula, as well as the caudate nucleus, a central brain region that relates to feelings of joy, serenity, self-awareness, and love (Lindstrom 2008) is activated by some stimuli which produce feelings of divine connection.

This research examines how the Apple devotee transforms his or her relationship with Apple, possibly equivalent to fervent religious meaning, into part of one’s life. Religion enables human beings to create meaning for their existence (Muñiz and Schau 2005). Modern consumers are provided evidence of their existence through possession of material objects that are interpreted by subjective meanings. For instance, Corona beer consumers usually put a wedge of lime in their bottle of Corona before drinking it (Lindstrom 2008). Without executing this ritual, Corona drinkers may not have the same level of satisfaction. Material consumption formulates and creates meanings through objects that shape one’s perspective. It is therefore reasonable to attempt an understanding of material consumption through a comparative lens of religion (Muñiz and Schau 2005).

Muñiz and Schau (2005) studied the Newton community, a small yet devoted group of Newton Personal Digital Assistant (PDA, see Figure 1) users strongly attached to the Apple Newton, a product introduced in 1993 and discontinued in 1998. Newton users considered themselves underdogs who experienced a marginal status. Marketers, including Apple, abandoned the Apple Newton, but devotees did not. "Supernatural, religious, and magical motifs are common in the narratives of the Newton community. There are strong elements of survival, the miraculous, and the return of the creator" (Muñiz and Schau 2005, p. 739).

Figure 1. Apple's Newton Personal Digital Assistant

The discontinuation of the Apple Newton product line in 1998 led its users to feel threatened, separated, and in a state of disconnection from the dominant power (Muñiz and Schau 2005). Their desperation drove the Newton community to religious belief and sacred motifs to perpetuate value, activities, communication, and devotion to this product.

In 2005, Apple paved its path to large-scale popularity as a mainstream phenomenon different from the non-mainstream experience of the Newton community. Users of the newer Apple products—i.e., the iPhone, iPad, and iPod—are so ubiquitous that a more recent trend has emerged: Apple users defining themselves in contrast to personal computer, or PC, users. Yet, by

shifting from a marginalized group to a mainstream group, the mentality of current Apple users already deviates from that of the Newton community. Devotion in both groups continued even as Apple transformed its image from being "cool" and "innovative" to commanding a powerful market dominance (Belk and Tumbat 2005). Incredibly, the zeal of Apple fans drove Apple to astonishing growth: 22,000 weekly visitors in an Apple store, one billion visitors in total, and $10 billion in sales by May 19, 2011 (Gallo 2012).

Critics of the Macintosh ("Mac") computer phenomenon often compare it to a religion (Lam 2001). Even among Mac fandoms, some consider their relationship with computer technology a form of religiosity, and others contemplate this relationship that they seek in terms of religion. Interestingly, the interviewees in Lam's study (2001) express skepticism toward organized religion. For example, some interviewees are sensitive about the idea that the cult-like following of Macintosh is a religion. Others, however, do not mind this analogy. Furthermore, explicitly religious communications on pro-Macintosh Web sites are commonly observed. For example, one Mac user in Lam's study says, "The Mac was the closest thing to religion I could deal with" (1994, c.f. Lam 2001).

Hirschman (1983) points to three possible reasons that religion and religion-like consumption is under-researched in the marketing field: 1) topics related to religion and consumption are still limited in consumer research (Mokhlis 2009); 2) the exploration of the relationship between consumption and religion is important because they are interactive and reciprocal, which makes interactions difficult to disentangle; and 3) religion not only influences how much we consume but also why we consume (Hirschman 1983). The analogy has been made that consumption *is* a new religion. Apple is a suitable entity to study because its

consumption is oftentimes a process of self-searching for meaning and validating one's existence through creation and possession (Belk 1988).

Research Question

This study combines one of the oldest human activities, religion, with one of the latest developed technologies, neuroscience, to explore and explain the process of how the growth of Apple can possibly be analogized as religion. For this study, I chose Catholicism as the religious group to examine. Catholicism is the largest single religious denomination in the U.S. (Delener 1994; U.S. Census Bureau 2012), but research regarding Catholicism is limited, and more focus should be paid to the study of this group (Delener 1994). According to the American Religious Identification Survey conducted by the U.S. Census Bureau in 2008, among the surveyed adult population in the U.S., 25% are Catholic (U.S. Census Bureau, 2012). Catholicism emphasizes family ties, which is one of the traits of the Apple community, as well as a basic mechanism to form a religion. Therefore, it is reasonable to compare Apple within the context of Catholicism for the purpose of this study.

It was crucial for me to identify the factors that cause an individual to react in a cult-like way to a specific brand and to determine what furthers the extreme worship mentality. With the curious nature of Apple's emerging cult-like phenomenon, this research attempts to answer the following question: *How, if at all, is religious devotion expressed by Apple fans?* More specifically, this study plans to answer two important research questions:

1. How, and to what degree, is Apple a cult-like religion for some individuals?
2. What are the differences in brain waves of Apple (Catholic) devotees and Apple (Catholic) indifferents when they view Apple (Catholic) stimuli?

It is not the purpose of this study to localize brain region functions; it is, however, to compare groups of Apple devotees and devoted Catholics to see how their brain waves change when viewing different stimuli, and then compare them. To that end, it is appropriate to address how Apple devotee attitudes toward Apple may apply to a religiously interpreted philosophy of being.

Theoretical Contribution

The theoretical contributions of this study are found in four areas. This study is based on Smart's (1989) seven dimensions of religion. Smart (1989) draws his dimensions of religion from a theological focus resting in discussion and observation of the components of religion. I intended to develop scales to measure each dimension with the aim of further understanding their importance from the perspective of marketing.

First, I will draw from Boome et al.'s (2011) study, which uses functional magnetic resonance imaging (fMRI) to localize regional reaction in the brains of Apple fanatics and in nuns. Boome et al.'s (2011) study concludes that Apple is a religion because the same brain regions light up when comparing the two groups. Therefore, my conclusion that Apple is comparable to a religion was drawn from this study.

However, human brain regions are in charge of multiple functions, meaning that localization in a brain area is not enough to indicate that Apple is equivalent to a religion. Other perspectives must be examined. For instance, in terms of the function of religion, Delener (1994) provides a well-defined explanation, "Religion can provide a framework which makes life understandable and interpretable" (p. 36). However, there is no study examining brain wave patterns in both Apple and religious devotees by using an electroencephalogram (EEG) to

measure their mental states. This study provides a methodological contribution to the field of marketing research.

Second, the seven dimensions of religion help to categorize the visual image stimuli used in this study. Some of the distinctive features related to Apple include the Apple logo, Apple products, Steve Jobs, and Apple stores, which can align with the seven dimensions of religion. From the reactions of Apple devotees, this study can therefore conclude whether the characteristics of the Apple "religion" fit the established criteria of a religion.

Third, previous literature examines the Apple brand community itself (Arora 2009; Felix 2012; Muñiz and O'Guinn 2001; Muñiz and Schau 2005; Schau and Muñiz 2006), but the individual reaction to brand categories (logo, products, people, and buildings) has not yet been examined as it relates to changes in brain waves. By capturing Apple devotees' reactions with neuroscientific tools, the results provide insights into evaluating individual differences as related to levels of devotion.

The pool of participants in this study focuses on both Apple and Catholic devotees. General users, but not devotees, of Apple products were recruited but are not targets for this study; the same criterion applies to practitioners of the Catholic faith. The reason that Apple devotees were chosen is that Apple devotees and Apple indifferents (general Apple users) were expected to demonstrate differences in their distinctive reactions toward the same visual stimuli.

Finally, Apple is used as a focus in this research due to frequent critical and popular comparisons of the company to religion. Through empirical measurements with the EEG equipment within the seven dimensions of religion, this study provides insight into market research for other businesses that desire to develop a cult-like, long-term relationship with their customers.

In Chapter II, I start with the brand's religious meaning to Apple devotees as well as to what extent they practice their "religion." I then offer a definition of religion; the dimensions of religion; and the characteristics of religion. In Chapter III, I elaborate the research design, explain selection of samples, and clarify the method I used to test the hypotheses derived at the end of Chapter II. In subsequent chapters, I will analyze and interpret my study findings, as well as suggest limitations and avenues for further research.

CHAPTER II

LITERATURE REVIEW

Meanings of Religion

Religion impacts consumer behavior in terms of values, decision-making, and judgments (MacInnis and Folkes 2010). When religion is used as a variable to differentiate an individual's behavior instead of a correlated component with religious goods, religion can be considered a predictor of consumer behavior (MacInnis and Folkes 2010). There are two important components of religion relevant to this study: 1) religious affiliation and 2) religiosity. Religious affiliation generally refers to the major religions of Christianity, Judaism, Islam, Buddhism, and Hinduism. Religiosity indicates the degree of belief.

There are several definitions of religion (Argyle and Beit-Hallahmi 1975; Batson et al. 1993; Bellah 1991; Clark 1958; Dollahite 1998; James 1961; O'Collins and Farrugia 2013; Peteet 1994). Among all of the definitions, they commonly address the infrastructure of the symbolic, religious system.

One definition of *religion* is "a unified system of beliefs and practices relative to the sacred things" (Delener 1990, p. 27). Focusing more on individual practices, *religiosity* may be defined as "the degree to which a person adheres to his or her religious values, beliefs and

practices and uses them in daily life" (Shukor and Jamal 2013, p. 69). Religion is associated with the infrastructure, system, and organizational form of the belief organization. A religious practice relies on personal beliefs and one's commitment to a relationship with God as well as the organization.

Smart (1989) defines religion as "some system of worship or other practice recognizing a transcendent Being or goal" (p. 11). One can also recognize a spiritual relationship in connection with other persons or nature. For example, in Bartkowski and Swearingen (1997), environmentalists found a spiritual association with Barton Springs, a natural resource in Austin, Texas, as their ultimate reality.

Stark and Bainbridge's (1996) definition of religion excludes the recognition of cults. They explain, "Cults are excluded because they represent an unconventional tradition" (p.16). This definition is different from the common usage of the meaning of "cult" in marketing literature. More importantly, Stark and Bainbridge's definition also posits that "humans have a persistent desire for rewards only the gods can grant, unless humans become gods" (1996, p. 23).

As apparent by the differences in these descriptions, there is no one conclusive definition of religion (Hood et al. 2009). The definition used typically varies depending on the purpose and needs of the study (Wilkes et al. 1986). The definition of religion that provides the most precise description for this study is from James (1961): "The feelings, acts, and experiences of individual mean in their solitude, so far as they apprehend themselves to stand in relation to whatever they may consider the divine" (p. 42). After all, an individual's reaction or perception boils down to how one sees oneself responding and relating to the divine, including one's relationship to God, religious objects, rituals, or experiences. This description therefore focuses on the individual level.

Brands and Their Relationship to Religion

It is commonly known that loyal customers—individuals—bring profits to a company. However, it is important to realize that corporate evangelizing is far more critical than a focus on consumer attitudes because of the potential found in "conversion experiences, unquestioning faith, dedication, sacrifice, and the search for salvation" (Belk and Tumbat 2005). The concept of "corporate evangelizing" is derived from protestant minister Billy Graham's School of Evangelism and was developed by Kawasaki, who was hired by Apple in the mid-1980s, to promote Mac hardware for software developers (Kawasaki 1992).

Other brand literature examines how brands become iconic (Holt 2004; Jenkins 2008). Jenkins focuses on the image of a corporation that hides its pursuit of profits behind a transformed image. This positive image, repackaged as the corporate icon, in turn, is used to lure the respect of its consumers. More importantly, Jenkins points out a transition stage of users and viewers continuously participating in rituals and practices. According to Jenkins (2008), "Only if the iPod becomes my iCon" can the cult phenomenon emerge (p. 481).

Jenkins (2008) explains how a corporation becomes an icon as an indication of symbolic realism through a cultural context. The abstract representation of an iconic meaning is conveyed through the image that is merged with the message and through the development of consistent marketing campaigns. The text in the ads and personalized characteristics behind the big corporation also affect a brand's iconic status.

On the other hand, Jenkins (2008) claims that the impact of these images and messages, conveyed through different media, also induces a tendency toward fear with respect to the ideology presented by Apple. This ideology as explained by the author expresses the power of a corporation. Further, if the ideology has a spiritual quality, respect arises spontaneously along

with fear because of the recognized power communicated through the representative meaning of an icon that the ideology intends to portray.

Ample research has demonstrated that some Apple users develop zeal toward the Apple brand and its products. The connection between religion and Apple has been discussed in the literature from the perceptive of a brand community, specifically the Apple community, and neuroscience. Academic research focuses on the following: brand community (Arora 2009; Felix 2012; Muñiz and Schau 2005; Muñiz and O'Guinn 2001; Schau and Muñiz 2006); brand influence on motivating behavior: Apple vs. PC users (Fitzsimons et al. 2008); brand image as ideology: iPod and iCon (Jenkins 2008); life satisfaction with the iPod (Cockrill 2012); symbolic realism of the iPod (Jenkins 2008); brains and brands (Perrachione and Perrachione 2008); social influences between PC and Apple users (Firmin et al. 2010); the cult of consumerism (Muñiz and Schau 2005); the strategic competitive advantage of Apple products (Tariq et al. 2011); and iReligion: The Bible app (Torma and Teusner 2011). Anthropologists view religion as a powerful tool for social bonding, which is also a way to sustain religion itself for survival advantages (Aamodt and Wang 2008). These survival advantages extend to those who believe in it to preserve rituals and traditions. Allen (2011) suggests that "Apple, and likewise HBO, has figured out how to develop a cult, not just in a business sense but in a sort of spiritual one."

Technological Belief

Markets involve the participation of sellers and consumers and the exchange of products. The possession of products helps consumers to form values through daily consumption (Bickle 2010). What Steve Jobs did beyond his competitors was combine spirituality and technology in business consumption into an inseparable ideology (Robinson 2013) that helped form one's values, identity, and religion to provide evidence of one's existence.

In the marketing context, a company brand may be able to develop an iconic influence over its users. The iconic influences of Apple have impacted its followers and cultivated a following of devotees. For Apple devotees, an Apple device is not simply a machine that enables them to connect to the world, but a machine that creates values and meanings that seem unexplainable. Lam (2001) suggests that human beings recognize the power of the computer and therefore extend their attachment and relationship to computers.

Steve Jobs maximized this relationship. As Robinson (2013) describes:

> Jobs' Zen master Kobun Chino told him that he 'could keep in touch with his spiritual side while running a business.' So in true Zen fashion, Jobs avoided thinking of technology and spirituality in dualistic terms. But what really set him apart was his ability to educate the public about personal computing in both practical and mythic ways...The iconography of the Apple computer company, the advertisements, and the device screens of the Macintosh, iPod, iPhone, and iPad are visual expressions of Jobs' imaginative marriage of spiritual science and modern technology. (Wired, n.p.)

Accordingly, Lam (2001) describes the relationship between humans and computers as a mythical process that may result in a fervor akin to that of fervent believers in a religion.

Brand Community

According to Muñiz and O'Guinn (2001), the definition of brand community is "a specialized, non-geographically bound community, based on a structured set of social relationships among admirers of a brand" (p. 412). Also, brand community can be characterized as "complex entities with their own cultures, rituals, traditions, and codes of behavior" (Schau and Muñiz 2002, p. 344).

Previous studies have explored the phenomenon of the Apple brand community as marginalized groups of consumers who helped solve issues among other consumers. For example, Muñiz and O'Guinn (2001) studied the Apple Newton community and how the evangelists in this community promoted the usage of the Newton PDA after it was discontinued in 1998. The community offered instructions for each other, even though Apple provided no technical support for Newton products, and it operated similarly to preserve rituals and a subculture that was not understood by the mainstream technology world.

On the same note, but from a different standpoint, Felix (2012) advocates the need to dissect consumers' motivations, attitudes, and decision-making processes on two levels: product and brand. At the product level, it is crucial to understand consumer barriers and conflicts that lead to choosing certain categories of products. Shachar et al. (2010) mention that at the brand level, companies ought to underline brand identity and differentiate their brand rituals and traditions, as well as display a moral responsibility to the consumers and society.

Religion and Personality

From the functional value of products (Sheth et al. 1991), consumers search for product traits that fit their needs. Consumption habits impact how and what consumers evaluate before they make purchasing decisions. Four types of iPhone users were identified: innovative users, techno-social users (Katz and Sugiyama 2006), utilitarian users, and Apple Acolytes (*c.f.* Arruda-Filho et al. 2010). These types were based on two dynamics: the hedonistic appeal of, and devotion to, the iPhone. Apple Acolytes are devoted consumers whose intense loyalty to the brand can help it survive through "poor product performance, scandal, bad publicity, high prices, and absence of promotional efforts" (*c.f.* Arruda-Filho et al. 2010, p. 475). A devotee, not simply a user, is more likely to form a religious-like attachment (Arruda-Filho et al. 2010). As a

dynamic and evolutionary categorization, iPhone users' preferences for new technology and devotion can change over time. The authors find that innovative users, defined as previously non-Apple users, can evolve their devotion to Apple to a level equal to that of the techno-social users. Moreover, techno-social users can possibly become Apple Acolytes. Yet, utilitarian users who can find alternatives become substitution users because their devotion to, and the hedonistic appeal of, the iPhone is low (Arruda-Filho et al. 2010).

Neuroscience and Religion

Each brain is wired slightly differently (Medina 2008). Those whose neural mechanisms demonstrate a propensity to the formation of religious beliefs are more likely to also prefer organizational structures and ways of practicing rituals in other forms, such as political events and Apple fan clubs (Aamodt and Wang 2008).

In order to understand how human brains comprehend religion, first we should be aware of the biological structure of our three and one-half pound brain. Neurons, the functional cell of the basic human nervous systems, carry sensory impulses through neural pathways to the brain (Newberg and D'Aquili 2008). The nervous system is organized into two parts: the central nervous system (CNS) and peripheral nervous system (PNS), the latter of which includes the autonomic nervous system and the somatic nervous system. The CNS consists of the brain and spinal cord and PNS includes nerves linking all the body's parts. The mind's mystical experience is relevant to four areas: the visual association area, the orientation association area, the attention association area, and the verbal conceptual association area (Newberg and D'Aquili 2008). Each specific area will be explained in the following paragraph (see Figure 2).

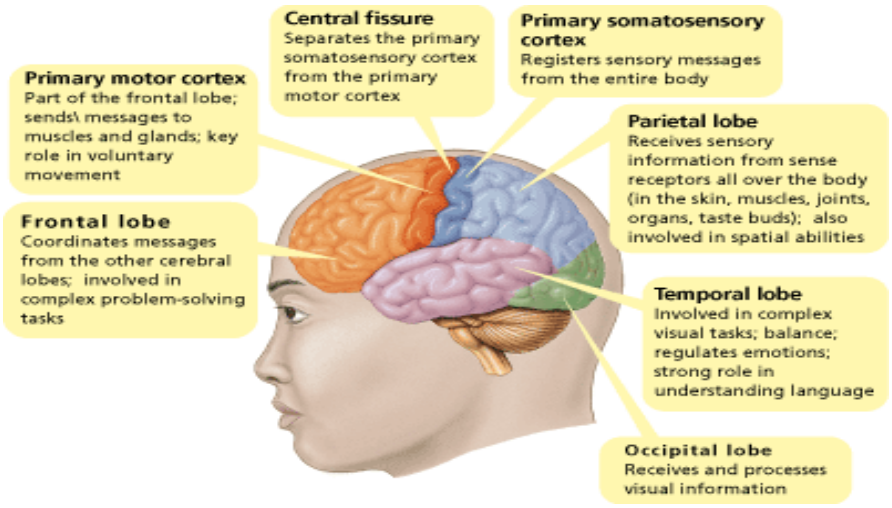


Figure 2. The Brain's Structure and Functions (Introdução à Psicologia 2015)

The visual association area consists of the occipital and temporal lobes. The former receives and processes visual information, and the latter helps us to perform complex visual tasks such as using a candle or a cross to formalize mediation or prayer. The orientation association area includes the posterior section of the parietal lobe, which processes sensory information such as hearing, touch, and vision from all over the body as well as overseeing spatial distinctions. This area is believed to be associated with spiritual experience because of its shaping of perception of "space and time, self and ego" (Newberg and D'Aquili 2008, p. 29). The attention association area is located in the prefrontal cortex of the brain, which deals with complex decision-making processes. This area is triggered in various religious states, especially among Zen meditators during EEG measurement (Newberg and D'Aquili 2008). Last, the verbal conceptual association area is located at the junction of the temporal, parietal, and occipital lobes; it processes abstract concepts and then transforms them into words (Newberg and D'Aquili 2008). This area directs important functions, such as causal relationships, that explain how we interpret myths and then describe them in the process of rituals.

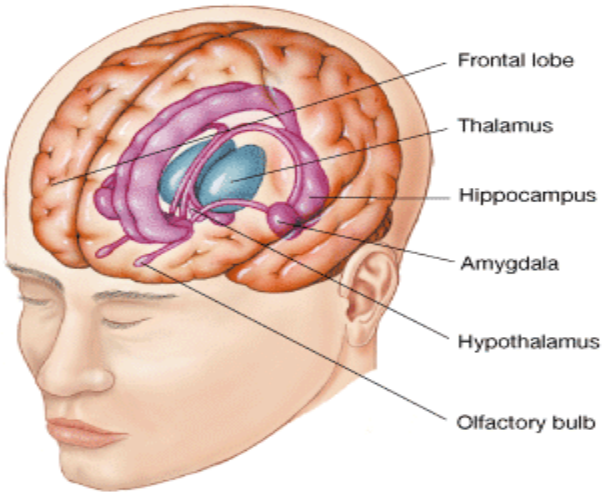


Figure 3. The Limbic System (Introdução à Psicologia 2015)

Other important brain machinery associated with religious experiences is the limbic system, which mainly includes the hypothalamus, amygdala, and hippocampus (see Figure 3). Studies have demonstrated that the limbic system is associated with religious experiences because subjects experience dreamlike states, hallucinations, and out-of-body experiences while in an induced spiritual state (Newberg and D'Aquili 2008). The hypothalamus controls the autonomic nervous system; the amygdala governs emotional functions; and the hippocampus generates emotions that are linked to memory, images, and learning. The limbic system integrates the nervous systems when reacting to stress.

Religion provides guidelines and rules for believers to follow, and religious beliefs help one to form the concepts of the moral values or judgments that formulate one's path to follow through one's cognitive development (Inzlicht et al. 2009). Neurologists explain the brain processes dealing with religion by explaining how human neurons process religion (Aamodt and Wang 2008).

Understanding how our brains process religion would not change believers' experiencing supernatural forces. These forces often function as guides to cognitive understanding of the supernatural.

Why is it important for us to know how human brains comprehend religion and other related concepts? The unique structure and function of the human brain allows humans to process information unlike any other creature. In order to form the construct of religion, two capabilities of the brain are required: the formation of and transmission of religious beliefs (Aamodt and Wang 2008). The latter capability enables humans to fabricate and shape social reasoning, which is highly developed in human beings and differentiated from other animals (Aamodt and Wang 2008). The ability to decipher a complicated idea, make a reference, create an abstraction, and infer unseen forethought requires the evolution and sophistication of the human brain to make sense of one's life and existence.

One of the purposes of religion is to provide guidelines and moral boundaries to help individuals behave in a socially-acceptable manner. If one is seeking understandable explanations about the events of one's life, then can perform religion this function (*c.f.* Inzlicht et al. 2009, p. 386). Therefore, religion can help to reduce insecurity and anxiety for a human being. Iyengar (2010) shows that people who follow a specific religion think more positively than those who are not religious. However, it is important to point out that atheists can behave positively, based on what they believe is the right action (Inzlicht el al. 2009). Inzlicht el al. (2009) used an EEG, a device measuring electrical activity in the brain, to identify two groups of people, religious and non-religious, through examining their Anterior Cingulate Cortex (ACC) reactions. The ACC is the area in the brain that deals with anxiety. ACC enables one to reduce prediction error to avoid making mistakes. The authors developed a Religious Zeal scale,

including “I aspire to live and act according to my religious beliefs;” “My religious beliefs are grounded in objective truth;” and “I would support a war that defended my religious beliefs” to evaluate subjects’ attitude towards their own religion. They found that people who are religious activate less in the ACC than those who are not religious when working on an assigned task. Strong beliefs in religion bring a conviction that one can deal with unfamiliar circumstances.

The Alpha Wave and How It Was Discovered

History

There is a long history of the study of electrical activity in the body. The earliest known experiments were conducted in the 1780s by Luigi Galvani at the University of Bologna, where he studied electrical activity in the bodies of animals. A century later, the British physician Richard Caton was the first to discover that electrical activity existed in the brains of animals. In 1929, Hans Berger published the first electroencephalography (EEG) recordings of a human brain (Walsh 2005). In that study, Berger discovered distinct EEG wave patterns in sleeping and waking states (Wang 2005). Berger’s EEG recording showed long trains of regular waves with a frequency of 8 to 13 cycle per second (cps), and he called these waves Alpha rhythm. In later studies, additional waves at different frequencies were discovered, and they were given names from the Greek alphabet: beta, gamma, delta, theta (Tether 2001) and less-studied waves such as mu and sensorimotor rhythm (Arroyo et al. 1993).

Alpha Wave

Early studies established that Alpha waves are associated with vision, as they are most prominent in the visual cortex—the part of the brain responsible for processing visual information (Shepherd 1988). This probably explains why blind children never develop Alpha

waves (Craighead et al. 2004). Alpha waves are most prominent when an individual is in a condition of relaxed wakefulness with eyes closed, and they lessen once eyes are opened (Craighead et al. 2004). The explanation for this phenomenon is that the Alpha rhythm is due to populations of brain cells acting in synchrony (an increase of activity), and that when someone is aroused, desynchronized activity occurs as different cells become active (Shepherd 1988). That is, when one opens his eyes (in the state of arousal), the Alpha wave is desynchronized (suppression of activity). Even though the Alpha wave is lessened when eyes are open, the Alpha wave is still a vital wave to research because of its connection to the feeling of transcendence (Goleman 2008), memory (Angelakis et al. 2007), intelligence (Doppelmayr el al. 2005), visual imagery (Cremades 2002; Cremades and Pease 2007; Kuan et al. 2004), attention (Schauerhofer et al. 2011), and information processing (Angelakis et al. 2007).

Herbert Krugman was the first to apply EEG to a marketing context. In his 1971 study, he examined the brain waves of a single subject while the individual viewed print and TV advertisements (Nevid 1984). In *Mosby's Dictionary of Medicine, Nursing and Health Professions* (2012), the Alpha wave is defined below, followed by the Beta wave and the Theta wave:

Alpha Wave. One of several types of brain waves, characterized by a relatively high voltage or amplitude and a frequency of 8 to 13 Hz. Alpha waves are the "relaxed waves" of the brain and constitute the majority of waves recorded by electroencephalograms registering the activity of the parietal and the occipital lobes and the posterior parts of the temporal lobes when the individual is awake, relaxed, but not attentive, with the eyes closed. Opening and closing the eyes affects the patterns of the Alpha waves and the Beta waves. These are also called Alpha rhythms or Berger waves.

Beta Wave. One of several types of brain waves, characterized by relatively low voltage and a frequency of more than 13 Hz, Beta waves are the "busy waves" of the brain, recorded by electroencephalograph from the frontal and the central areas of the cerebrum when the patient is awake and alert with eyes open.

Theta Wave. One of several types of brain waves characterized by a relatively low frequency of 4 to 7 Hz and a low amplitude of 10 μV, Theta waves are the "drowsy waves" of the temporal lobes of the brain and appear in electroencephalograms when the individual is awake but relaxed and sleepy.

Chapter III discusses the theoretical foundation of this research, with explanations of the seven dimensions of religion and its relationship between neuroscience and Apple. Each dimension is explained, and examples of these dimensions are provided by Ninian Smart (1989, 1998). The test hypotheses are presented at the end of Chapter III.

CHAPTER III

CONCEPTUAL FRAMEWORK AND THEORETICAL FOUNDATION

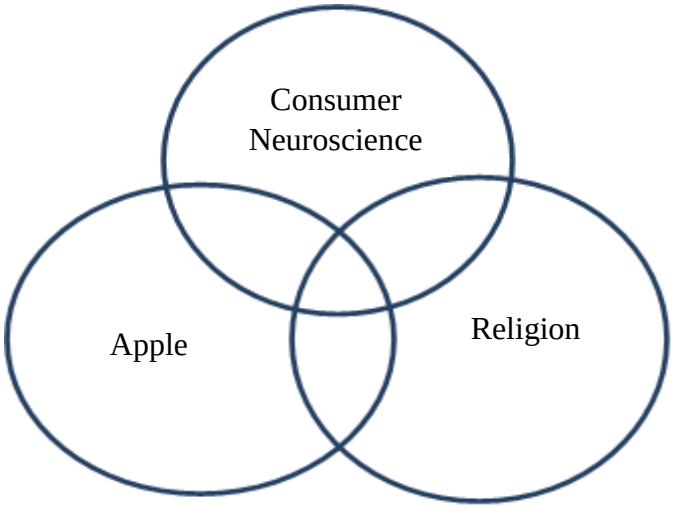


Figure 4. Conceptual Framework

Figure 4 represents the conceptual framework of this research, which incorporates the theoretical foundation of religion in comparison to the Apple cult-like phenomenon, through the understanding and measurement of neuroscientific techniques. The first section of Chapter II introduced the components of this comparison study of Apple and religion. Consumer neuroscience is the third element of this study. Consumer neuroscience is similar to neuromarketing, but with a subtle difference. Lee et al. (2007) defines *neuromarketing* as referring to "the application of neuroscientific methods to analyze and understand human behavior in relation to markets and marketing exchanges" (p. 200). More importantly, the significance of neuromarketing lies

with its application for consumer research and managerial indications (Hubert and Kenning 2008). Consumer neuroscience focuses on understanding consumer behavior from an academic perspective, which is the area to which this study aims to contribute.

Specifically, this study compares Apple devotee reactions to stimuli and religious devotee reactions to stimuli to see how similar the two groups, Apple devotees and religious devotees, are vis-à-vis their reactions. Therefore, it is necessary to evaluate the General Theory of Religion and the dimensions of religion before comparing religious devotees to the devotees of Apple.

Seven Dimensions of Religion

Smart (1989) proposes seven dimensions of religion in his book, *The World's Religions*. Each dimension is explained and examples provided; the definitions are provided below. These seven dimensions are not final and can be expanded as religion changes. The detailed explanations and examples of the seven dimensions of religion (Smart 1978; Smart 1989, p. 12-20; Smart 1996) are:

1. The practical and ritual dimension: includes regular worship, praying, and marching. This dimension is particularly important to faith in the form of a sacrament. Furthermore, patterns of behavior, considered practices rather than rituals, are ways to develop spiritual awareness as well as ethical perspectives. Yoga in the Buddhist and Hindu traditions is one example.
2. The experiential and emotional dimension: contains religious experience and feelings of being exposed to sacred awe, calmness and peace, the perception of emptiness, love, sensations of hope, and gratitude for favors being answered. Visions, revelations, enlightenment, and religious ecstasy are examples. Rudolf Otto coined the term *numinous*, referring to a feeling that one is drawn to a mysterious force, but at the same

time, that force brings an "awe-permeated fear" (Smart 1989, p. 13).

3. The narrative and mythic dimension: strongly connected with the experiential dimension and is often integrated with the ritual dimension. In other words, it is the "storytelling" of a religion. Examples include written and oral forms of informal teachings, tales, adventures, alternative histories, and predictions about its founder, heroes, saints, the Evil One, and even the end of time. In the modern study of religion, a myth is not necessarily false because historians preserve, maintain, and research documents and scriptures.
4. The doctrinal and philosophical dimension: refers to the aspect of religion that describes relatively abstract and philosophical terms. Examples include the Trinity doctrine in Christianity, Incarnation (Jesus as God), Christian tradition, attempts to provide explanations of the Divine Being, the meaning of creation, and the belief in one God in Christianity. Conversely, the doctrinal dimension in Buddhism is the philosophical projection of the world as an aid to salvation (Smart 1998, p. 17) and impermanence. The "law of *karma*," or action, influences one's behavior because of reincarnation. An individual is reborn through many lives as a virtual traveler. One's destiny is determined by the deeds performed in the previous and current life (Smart 1998, p. 48).
5. The ethical and legal dimension: includes the laws and moral and formal guidelines derived from the system. This dimension coincides with the ritual dimension because the rules are imposed upon nations and communities. For instance, love is the main ethical attitude in the Christian faith; the Father, Son, and Holy Spirit were bonded through the connection of love.
6. The social and institutional dimension: the sixth and seventh dimensions require a physical form, whereas others are simply abstract. This dimension includes the study of a

formal organization that involves a group of people and observations to see how it works among them, such as a church, the Indian caste system, or the variety of sacred persons or animals in the Hindu religion (Smart 1998). The influence and understanding of faith can be observed among a group of people and this involves the sociological component and institutional form of religion. One's social identity may be recognized within a small group of people, or it may be in line with the society on a larger scale. Yet gurus, mystics, prophets, and saints may play a revolutionary role in the group, leading to a new interpretation of the religion.

7. The material dimension: refers to buildings, architecture, art, images, icons, and instruments of ritual. These examples are in either simple or elegant presentations. Other examples also include the natural attributes of the Earth as well as sacred sites of human creation, which could be important to the system. These can include such examples as sacred mountains, holy ground, and the holy city of Jerusalem.

These seven dimensions serve as fundamental concepts for social scientists, neuroscientists, and anthropologists to explore and explain human behaviors. Specifically, social scientists can explore the phenomena of all seven dimensions in descriptive and quantitative measurements in the virtual and physical world.

In these seven dimensions of religion, Smart (1989) fails to mention brain reactions. Aamodt and Wang (2008) explain that the brain reacts to religion as a form of reasoning. There are several levels of reasoning that one seeks. Even though neuroscientists are limited in their ability to pinpoint the specific areas for reasoning, there is evidence of *reward neurons* shown in three brain areas: the orbitofrontal cortex, striatum, and amygdala (Aamodt and Wang 2008, p.

119), all of which are related to specific types of rewards. See Figure 5 for the specific locations of these three areas.

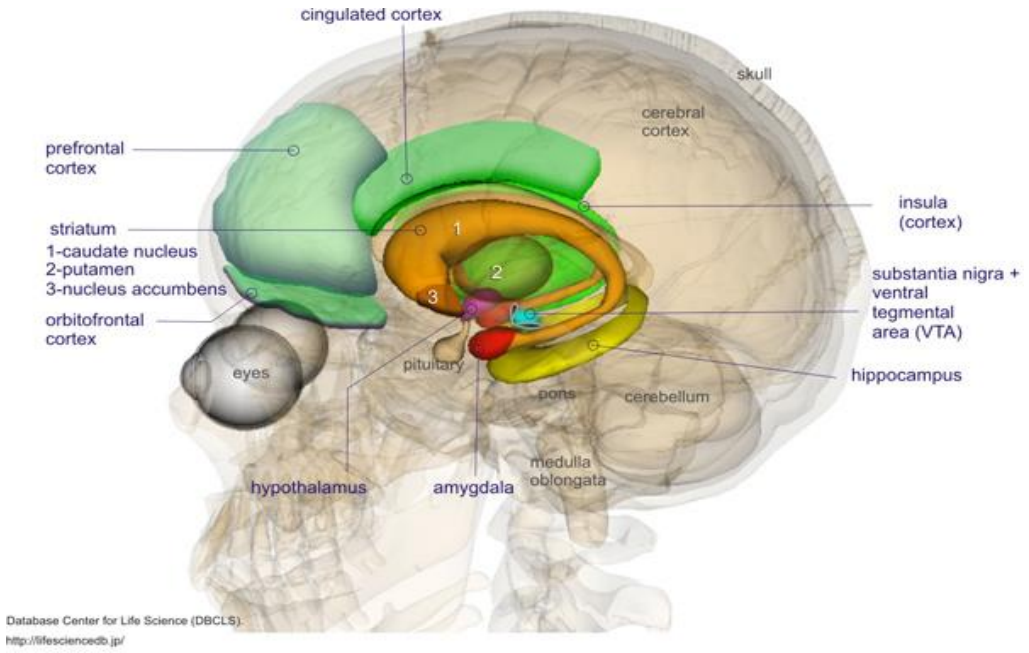


Figure 5. Lateral View of Brain Areas Associated with Reward (Cell Biology Promotion 2015)

Human brains also identify meanings conveyed through symbols, because in the primitive era, a powerful symbol represented a chance of survival and therefore genetic extension. Bourdieu (1991) presents the power of symbols as "that invisible power which can be exercised only with the complicity of those who do not want to know that they are subject to it or even that they themselves exercise it" (p. 164). He highlights the subjectivity of interpretation of symbols by pointing out that different factions of people become involved in a struggle "aimed at imposing the definition of the social world that is best suited to their interests" (p. 167).

The implication for this study is that from the neurological feedback of one's reaction to visual images, one can determine whether Apple serves as if it were a religion. When a

possession has enabled one to feel calm, such as religion does, then the relationship between the possession and oneself is more likely to become long term.

One of the purposes of religion is to reduce anxiety and increase a sense of calmness. When a possession has a function similar to religion, the level of anxiety decreases while using and having the possession—in this case an Apple product. This reflects Belk's (1988) having, doing and being as well as the original goal of Jobs when he created Apple products. That is, through the possession of Apple products and creating work by doing, one has left evidence of being, and it is meaningful to him or her that the creation itself is part of their being. Even though one may not be a professional photographer, musician, or video editor, it takes little effort to create professionally displayed work with a few finger clicks with an iPhone, iPod, or Mac.

Hypotheses

This study measured Alpha waves to compare two groups at a time (See Figure 6). The following section first draws out the hypotheses tested.

		Apple	
		High	Low
Catholicism	High	Alpha wave (G1)	Alpha wave (G2)
	Low	Alpha wave (G3)	Alpha wave (G4)

Figure 6. Classification of Devotees and Indifferents in Catholic and Apple Groups

Figure 7 demonstrates the hypotheses tested for all groups: G1 vs. G2 (H1a), G3 vs. G4 (H1b), G1 vs. G3 (H2a), G2 vs. G4 (H2a), G1 vs. G4 (H3a-1; H3a-2), and G2 vs. G3 (H3b-1;

H3b-2). Each relationship would be explained in the following section with graphic demonstration, especially when Group 1 compared to Group 4 and Group 2 compared to Group 3.

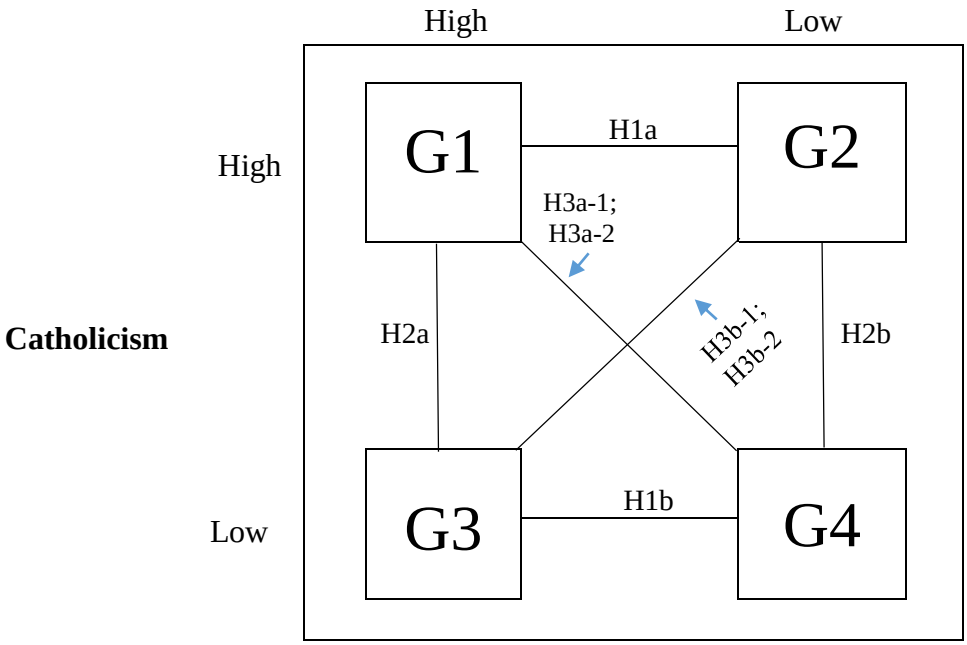


Figure 7. Hypotheses Testing between Groups

Apple and Alpha Wave

Consumer research studies have described cult-like phenomena in the context of Apple (Belk and Tumbat 2005), as well as other cult brands including Harley-Davidson, Volkswagen, and *Star Trek*. Particularly, the interviewer in Kozinets (2001) mentions that fans consider *Star Trek* a way to replace religion. More importantly, Martin Lindstrom (2008), using fMRI, showed several cult-branded images, including Apple, to fans and found that the same brain regions lit up as in those who were devoted to religion. Therefore, the conclusion of Lindstrom's (2008) study was that Apple *is* a religion. With this strong claim, if Apple *is* a religion, or equivalent to a religion, its fandom should have a similar feeling towards it as they would a religion. In line with this, Custódio (2010) showed that when one dislikes a brand, based on self-reporting, their Alpha waves were less activated in the occipital regions. On the other hand,

a strong preference for a brand can override sensory information (McClure et al. 2004). Based on the previous research, it is hypothesized that:

H1a: People who have a high degree of devotion to Apple and to Catholicism have higher Alpha waves when they view Apple stimuli than people who are indifferent to Apple.

H1b: People who have a high degree of devotion to Apple and a low degree of devotion to Catholicism have higher Alpha waves when they view Apple stimuli than people who are indifferent to Apple.

The Connection between Religion and Alpha Wave

Religious studies have examined changes in Alpha waves when one prays, meditates, and performs the *salat* (an Islamic prayer sequence). Subjects have included nuns, monks, and laypeople. Teake et al. (2013) found that "people who rated religion or spirituality as highly important have greater Alpha waves than those who do not."

In addition, Kasamatsu and Hirai (1969) report that persistent Alpha waves appear after the end of Zen meditation. Alpha waves represent the awakened consciousness and a steady responsiveness. Doufesh et al. (2012) found that Muslim prayer increases Alpha waves observed by EEG in the brain when the subject practices both actual *salat* (prayer with both postures and supplications) and the "acted" version (postures without spoken prayer). Alpha waves are associated with the feeling of transcendence, based on a subject's self-report (Goleman 2008). Furthermore, Vaghefi et al. (2015) found that Muslims who listen to the Quran have increased levels of Alpha waves. Anand et al. (1961) measured four Indian yogis during their mediation practice. They found that Alpha amplitude increased in the mediation state and that prominent Alpha waves increased in the resting state. Anand et al. (1961) suggest that EEG brain activity is associated with a meditative state of consciousness. Based on previous research

examining the association between Alpha waves and the transcendent state, it is hypothesized that:

H2a: People who have a high degree of devotion to Catholicism and to Apple have higher Alpha waves when they view Catholic stimuli than people who are indifferent to Catholicism.

H2b: People who have a high degree of devotion to Catholicism and a low degree of devotion to Apple have higher Alpha waves when they view Catholic stimuli than people who are indifferent to Catholicism.

In Figure 8, participants in Group 1 (high levels of devotion to Apple and Catholicism) and Group 4 (low levels of devotion to Apple and Catholicism) both saw Apple and Catholic visual stimuli. Be aware of the following: these two groups have extreme levels of devotion to both Apple and Catholicism; the same literature applies to these two groups while they viewed

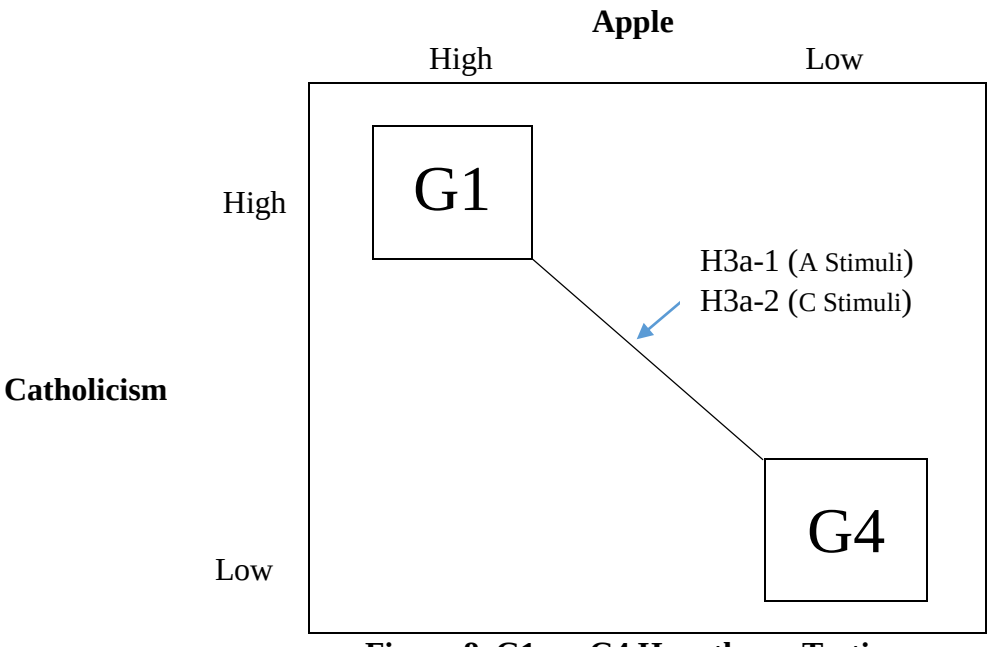


Figure 8. G1 vs. G4 Hypotheses Testing

two stimuli consequently; the assumptions made rest on the same logic towards their reactions to both stimuli. Therefore, I then hypothesized that:

H3a-1: People who have a high degree of devotion to Catholicism and Apple will have higher Alpha waves when they view Catholic stimuli than people who are indifferent to Catholicism and Apple.

H3a-2: People who have a high degree of devotion to Catholicism and Apple will have higher Alpha waves when they view Apple stimuli than people who are indifferent to Catholicism and Apple.

On the other hand, in Figure 9, participants in Group 2 (low level of devotion to Apple and high level of devotion to Catholicism) and Group 3 (high level of devotion to Apple and low level of devotion to Catholicism) both saw Apple and Catholic visual stimuli, even with their different levels of devotions to Apple and Catholicism.

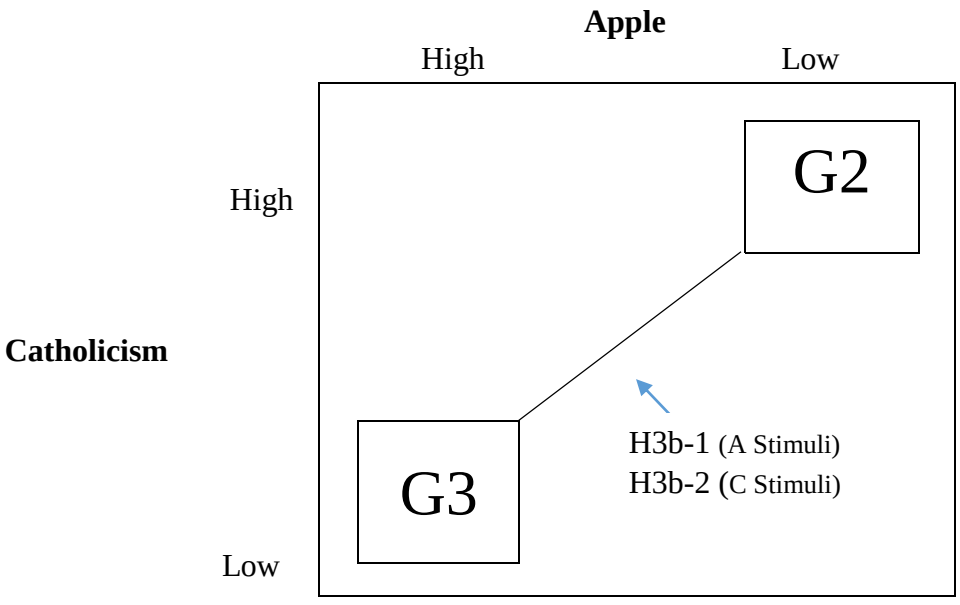


Figure 9. G2 vs. G3 Hypotheses Testing

The same literature previously mentioned also applies to these two groups while they viewed two stimuli consequently. It was then hypothesized that:

H3b-1: People who have a low degree of devotion to Apple and high devotion to Catholicism will have lower Alpha waves when they view Apple stimuli than people who have a high degree of devotion to Apple and low devotion to Catholicism.

H3b-2: People who have a low degree of devotion to Apple and high devotion to Catholicism will have higher Alpha waves when they view Catholic stimuli than people who have a high degree of devotion to Apple and low devotion to Catholicism.

Chapter IV explains the research design, steps of Study 1 and Study 2, and the setup and process of the EEG experiment.

CHAPTER IV

METHODOLOGY

The purpose of this research is to explore whether, for Apple devotees, Apple is a religion. It is first necessary to examine what constitutes a religion, and then use the same framework of religion to evaluate the devotees' perceptions to Catholicism or Apple.

In the first stage, a questionnaire was used to test the Apple and Catholic devotees. The purpose of the scale development was to allow participants to convey the meanings of religion and the meanings of Apple individually. The seven dimensions were then used to gather visual image stimuli that fit the description of each dimension. The participants' reactions to the various stimuli were then measured for significant and different reactions to each dimension in the context of Apple and religion. The results then led to the conclusion that certain dimensions are more meaningful to the targeted devotees, Apple users and Catholics. The empirical testing related to the seven dimensions of religion enabled further understanding of how Apple and Catholic devotees set priorities among the seven dimensions in their beloved brand and religion.

Previous scales developed in the literature measure religious belief as it influences the decision-making process in consumption (Delener 1990; Delener 1994; Hirschman 1983; Mokhlis 2009; Shukor and Jamal 2013; Wilkes et al. 1986). In these studies, three dimensions of religion, "belief, ritual, and experience," are typically measured (Tan 2006; Tan and Vogel 2008).

Since existing scales did not fit precisely the purpose of this study, modifications were made to existing measures (Donahue 1985; Tan and Vogel 2008; Worthington et al. 2003) based on the seven dimensions of religion (Smart 1989). In addition, there is no existing Apple religiosity scale meeting the purpose of this research. These new scales were used to assess the degree of Apple and Catholic devotion. During this research, a Catholic scale was developed based on previous literature, and then an Apple scale was developed to align with the items in the Catholic scale.

Research Design

I conducted a pilot study and two main studies. The pilot study examined the newly developed Apple and Catholic scales based on the seven dimensions of religion (Smart 1989) to assess the degree of devotion found in Apple devotees as well as that of Catholic devotees. The validated items from the pilot study were used in Study 1. The purpose of using Study 1 was to evaluate the devotion of Apple and Catholic devotees with their own self-evaluations. The rationale of Study 2 was to measure psychophysical responses toward Apple and Catholic stimuli through the EEG device, based on participants' evaluations in Study 1. The hypothesis testing is based on the results of Study 2. Figure 10 demonstrates the steps involved in the studies conducted in this research.

In Study 2, utilizing a factorial design, participants were recruited, based on self-reporting, who fit into the categories of Apple devotees (high vs. low) and Catholic devotees (high vs. low). Two criteria were used to filter for qualified participants. High vs. low indicated participants who were highly and rarely involved with Apple products as one of the criteria. The other categorical factor, Catholicism, was used to look for participants who were devoted (or not devoted) to their religion.

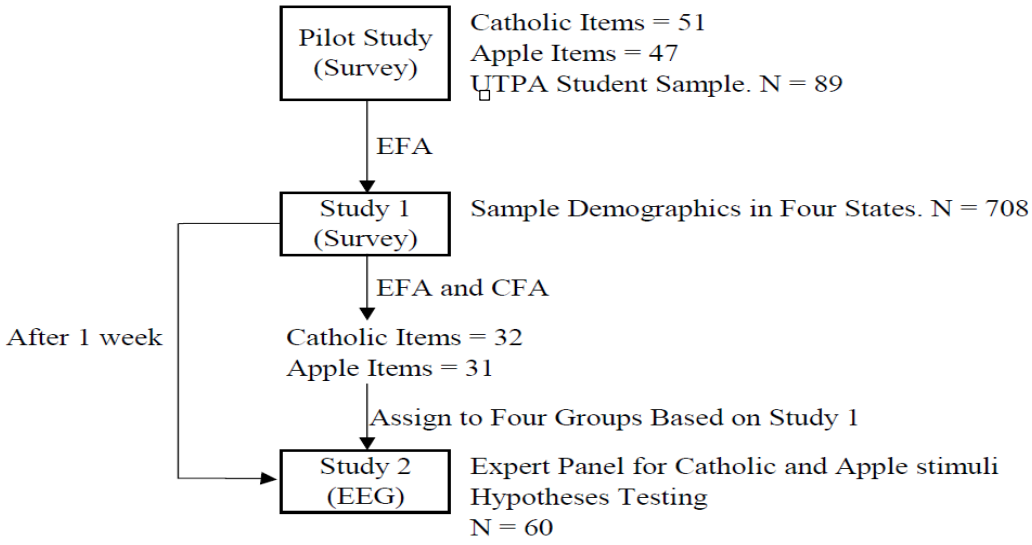


Figure 10. Steps of Studies Conducted

Apple (Catholic) "indifferents" in this study indicates people who have a low level of devotion to Apple (Catholicism). The experimental design involved a between-subjects comparison. Factorial design involved classification factors from designs involving experimental factors. That is, a non-orthogonal design was used based on the self-evaluated levels of devotion in Apple and Catholicism (Maxwell and Delaney 1990, p. 273). This study used factorial ANOVA (analysis of variance) to compare cell means (Maxwell and Delaney 1990).

Pilot Study

The new scales, in the Catholic and Apple context, were developed by the researcher and verified by the committee members to finalize the Catholic and Apple scales with 51 and 47 items in the pilot study. Participants were asked to answer each question on a scale of 1 to 10 (1 being "Strongly Disagree" and 10 being "Strongly Agree"). The pilot study was an online survey distributed through convenience sampling to four undergraduate classes at UTPA through Qualtrics.

The data collection timeframe for the pilot study was from April 1 to 14, 2014. Participants were asked for their instructor's name and their student ID number in order to earn extra credit for taking the survey. Participants were required to be a Catholic and had to have used an Apple product to fit the criteria of this research. In order to avoid biased answers from the online survey, participants were asked to choose their religious belief if he or she was not a Catholic. Even though a Catholic can be referred to as a Christian, a Christian is not necessary a Catholic. Therefore, the first question asked was, "Are you a Catholic?" If the participant chose the answer, "No," The second question asked was, "What is your religious belief?" The answer options for religious belief included: Christianity, Islam, Buddhism, Judaism, and Others. The available option of "Others" takes into consideration the fact that some are atheists or have a religious belief that is not affiliated with any religious organization listed. Options for an online survey should be inclusive and mutually exclusive. Therefore, the option of "Others" allowed participants to choose if they considered their religious belief not affiliated with the options provided in the online survey. The third question of the survey appeared next: "I have used Apple products before." Participants who chose "No" would not be included in the study and the survey would end after three questions.

There were 161 questionnaires gathered for the pilot study. Among all responses, five (3.1%) of them had never used Apple products; four (2.4%) were incomplete (more than 50% of the questions were missing); 89 (55.2%) were Catholic; and 63 (39.1%) were non-Catholic. Among the 63 non-Catholics, 47 respondents identified themselves as non-Catholic Christians; two were Buddhist; and 14 were "Others." Eighty-nine questionnaires from UTPA students who were both Catholic and Apple users were selected for the pilot study.

Exploratory Factor Analysis—Pilot Study

Exploratory Factor Analysis (EFA) and reliability tests were conducted in the pilot study in order for the newly developed items to be parsimonious. The lengthy initial questionnaire, with a total of 98 items before the pilot study, could potentially cause fatigue of survey participants and therefore needed to be reduced.

The data were analyzed through EFA using SPSS 21. Before conducting EFA, Kaiser-Meyer-Olkin (KMO) tests of sampling adequacy and Bartlett tests of sphericity were conducted in order to provide statistical evidence that the data were appropriate for proceeding to factor analysis. Before proceeding to EFA, the correlations among items were examined. The threshold of correlation coefficients between each item is above 0.3 (Hair et al. 2013; Tabachnick and Fidell 2012). Next, a measure of sampling adequacy (MSA) was performed. The MSA values were recommended to be at least .5 or above (Hair et al. 2006).

This study used Principal Components in the EFA analysis. Smart (1998) indicated the correlation between each dimension. The basis of religion as a multidimensional concept (Allport 1954; Glock 1954; King 1967; King and Hunt 1975) was used as a theoretical framework. The researcher used Promax, an oblique rotation, to demonstrate the nature of correlations (Fabrigar et al. 1999) between each dimension. Items were excluded due to the combination of multiple testing in the following: cross-loadings (Hair et al. 2010), low loading if below .4 (Bearden et al. 2010), partial correlations if above .7 (Hair et al. 2010), inter-item correlations if below .2 (Bearden et al. 2010), and corrected item-to-total correlations if below .35 (Bearden et al. 2010). Most importantly, the item was removed if it did not load in any one of the generated factors. The Catholic scale generated five factors in the EFA with corresponding items (see Table 1). Each factor was then examined with Cronbach's Alpha, which ranged from 0.858 to 0.95. A total

of 19 items were removed in the Catholic scale in the pilot study. Therefore, 32 items remaining in the Catholic scale for Study 1.

Table 1. Factors Generated from the Catholic and Apple Scale in the Pilot Study

Catholic Factor 1		**Cronbach's Alpha**
CD5	I believe God created the universe.	0.95
CE5	Believing in my religion is comforting.	
CE6	My religious belief makes me feel secure.	
CN2	The story of Jesus Christ shapes my belief.	
CN3	I think the stories in the Bible are well documented.	
CN4	I believe in the miracles written in the Bible.	
CN5	The Creation Story in the Bible is a symbolic narrative of how the world began.	
CN6	The stories in the Bible define who I am.	
CR13	I pray to Saints.	
Catholic Factor 2		0.939
CD1	I spend time trying to grow in understanding my faith.	
CD3	The Ten Commandments of The Bible are what I believe in.	
CL1	Religion is concerned with my greatest values.	
CL3	My religious belief guides my judgment of right and wrong.	
CL4	Religion is the foundation for establishing ethics.	
CL6	My religious belief helps me to make ethical decisions.	
Catholic Factor 3		0.89
CI1	I make financial contributions to my religious organization.	
CI2	I enjoy working in the activities of my religious affiliation.	
CI3	I keep well informed about my local religious group.	
CI4	I have influence in the decisions of my local religious group.	
CR2	I rarely go to church.	
CR10	I go to Mass every week.	
Catholic Factor 4		0.881
CE3	Religion is relevant to my deepest feelings.	
CE4	Any spiritual experience could be considered a sign connecting with God.	
CE7	I have felt the presence of God.	
CR7	I pray the rosary every day.	
CR11	I pray every day.	
CR14	I pray every day without the need to go to Mass.	
Catholic Factor 5		0.858

CM1	I often purchase books about religion.	
CM2	I purchase items from religious bookstores regularly.	
CM3	I watch religious-themed shows and speeches frequently.	
CM4	I listen to religious-themed music daily.	
CM5	I collect religious-themed items.	
Apple Factor 1		0.91
AE1	I consider Apple products sacred.	
AE2	My relationship with the Apple brand is real.	
AE3	If I don't have my Apple products nearby, I feel a sense of emptiness.	
AE4	I think about Apple, Inc., all the time.	
AE5	I have a profound relationship with the Apple brand.	
AR7	I really worship Apple, Inc.	
AI6	I am strongly supported by the Apple (online) community.	
Apple Factor 2		0.908
AE6	I love using my Apple products.	
AM2	I am a loyal customer of Apple, Inc.	
AM3	I find Apple products appealing.	
AM4	Apple stores attract my attention.	
AR3	I do not like Apple, Inc., so I do not care to buy any Apple products.	
AR4	I like the Apple brand.	
AR5	I only use Apple products.	
Apple Factor 3		0.811
AD3	The simplicity of Apple products is the source of Apple's growth.	
AN2	The stories about Steve Jobs starting Apple, Inc., tell everything about the company.	
AN3	I am affected by the stories about Steve Jobs.	
AN4	I am totally captivated by the stories about Apple, Inc.	
AN5	Stories about Steve Jobs are inspiring.	
Apple Factor 4		0.884
AI1	Owning Apple products gives me a sense of belonging.	
AI2	Seeing people use Apple makes me feel good.	
AI3	I like to hang out with people who use Apple products.	
AI4	Owning Apple products makes me feel powerful.	
Apple Factor 5		0.751
AD4	Apple products are always ahead of others in innovation.	
AD6	Apple, Inc., creates products for creative types.	
AL4	Any decision Apple, Inc., has made is legal.	
AR9	I often browse Apple's online store.	
Apple Factor 6		0.685

AL1	Apple, Inc., does not cheat its customers.
AL2	I don't think Apple, Inc. is truthful to its customers.
AL3	The legal issues against Apple, Inc., do not affect my opinions about the company.
AL5	Apple, Inc., sets the standard for patent protection.

The Apple scale generated six factors in the EFA with corresponding items (see Table 1). Each factor was conducted using Cronbach's Alpha, which ranged from 0.685 to 0.910. Apple's Legal factor is slightly lower, but very close to the threshold of 0.7 (Hair et al. 2010). A total of 16 items were removed in the Apple scale in the pilot study. Therefore, there are 31 items in the Apple scale for Study 1.

Table 2 demonstrates the definition of each dimension, the source of the scales in the literature, developed items, and also the remaining items used in Study 1.

Table 2. Definitions of Seven Dimensions of Religion and Items Used in the Pilot Study

Practical/ Ritual Definition	This dimension is particularly important with faith in the form of a sacrament. Patterns of behavior, considered practices rather than rituals, are ways to develop spiritual awareness as well as ethical perspectives.		
Scale derived from	Worthington et al. 2003; Thurston and Chave 1964		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CR1	I often read books and magazines (online) about my faith.	AR1	I read about Apple, Inc., as often as I can.
CR2**	**I rarely go to church.** *RC**	AR2	I often pay attention to Apple products.
CR3	I do not go to church because I do not hear any scientific discussion. *RC*	**AR3**	**I do not like Apple, Inc., so I do not care to buy any Apple products. *RC***
CR4	I find the services of the church restful.	**AR4**	**I like the Apple brand.**
CR5	I enjoy a fine ritual service when I go to church.	**AR5**	**I only use Apple products.**
CR6	I believe in organized religion without the need to go to church.	AR6	I wish to visit the Apple retail store annually.

CR7	**I pray the rosary every day.**	**AR7**	**I really worship Apple, Inc.**
CR8	I kneel when I pray.	AR8	I find the services provided by Apple, Inc., satisfactory.
CR9	I believe in sincerity and goodness without the need to go to church.	**AR9**	**I often browse Apple's online store.**
CR10	**I go to Mass every week.**		
CR11	**I pray every day.**		
CR12	I like the ceremonies of my church but do not miss them much when I stay away.		
CR13	**I pray to saints.**		
CR14	**I pray every day without the need to go to Mass.**		
Experiential/ Emotional Definition	This dimension contains religious experiences and feelings of being exposed to sacred awe, calm and peace, as well as the perception of emptiness, love, sensations of hope, and gratitude for requests for favors being answered.		
Scale derived from	Thurston and Chave, 1964; Allport and Ross 1967		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CE1	I have had mystical experiences when I tried to communicate with God.	**AE1**	**I consider Apple products sacred.**
CE2	I do not think mystical experiences are real. *RC*	**AE2**	**My relationship with the Apple brand is real.**
CE3	**Religion is relevant to my deepest feelings.**	**AE3**	**If I don't have my Apple products nearby, I feel a sense of emptiness.**
CE4	**Any spiritual experience could be considered a sign connecting with God.**	**AE4**	**I think about Apple, Inc., all the time.**
CE5	**Believing in my religion is comforting.**	**AE5**	**I have a profound relationship with the Apple brand.**
CE6	**My religious belief makes me feel secure.**	**AE6**	**I love using my Apple products.**
CE7	**I have felt the presence of God.**	AE7	I love my Apple products.
Narrative/ Mythic Definition	The "storytelling" of a religion. The examples include written and oral forms of informal teaching, tales, adventures, alternative histories, and predictions about its founder, heroes and saints, the Evil One, and even the end of time.		

Scale derived from	Worthington et al. 2003; Thurston and Chave 1964; Ganzevoort 1998; Faulkner and De Jong 1966		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CN1	Magic, superstition, and myth are critical components of religious belief.	**AN1**	**The stories about Steve Jobs starting Apple, Inc., tell everything about the company.**
CN2	**The story of Jesus Christ shapes my belief.**	AN2	The stories about Apple, Inc., influence my evaluation of other comparable products.
CN3	**I think the stories in the Bible are well documented.**	**AN3**	**I am affected by the stories about Steve Jobs.**
CN4	**I believe in the miracles written in the Bible.**	**AN4**	**I am totally captivated by the stories about Apple, Inc.**
CN5	**The creation story in the Bible is a symbolic narrative of how the world began.**	**AN5**	**Stories about Steve Jobs are inspiring.**
CN6	**The stories in the Bible define who I am.**	AN6	Stories about Apple, Inc., are not important to me.
Doctrinal/ Philosophical Definition	This dimension refers to the aspect of religion expressed in relatively abstract and philosophical terms.		
Scale derived from	Worthington et al. 2003; Thurston and Chave 1964; Allport and Ross 1967		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CD1	**I spend time trying to grow in understanding my faith.**	AD1	I spend a great deal of time gaining knowledge about Apple products.
CD2	I think the organized church is an enemy of science.	AD2	The design of Apple products is the reason for Apple's success.
CD3	**The Ten Commandments of the Bible are what I believe in.**	**AD3**	**The simplicity of Apple products is the source of Apple's growth.**
CD4	We were all born sinners.	**AD4**	**Apple products are always ahead of others in innovation.**
CD5	**I believe God created the universe.**	AD5	Only Samsung corporation can compete with Apple, Inc.
CD6	I believe in life after death.	**AD6**	**Apple, Inc., creates products for creative types.**
Ethical/ Legal Definition	This dimension includes the laws, morals and formal guidelines derived from the system.		

Scale derived from	Thurston and Chave 1964; Allport and Ross 1967		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CL1	**Religion is concerned with my greatest values.**	**AL1**	**Apple, Inc., does not cheat its customers.**
CL2	Religion shapes my perception of hypocrisy.	**AL2**	**I don't think Apple, Inc., is truthful to its customers. *RC***
CL3	**My religious belief guides my judgment of right and wrong.**	**AL3**	**The legal issues against Apple, Inc., do not affect my opinions about the company.**
CL4	**Religion is the foundation for establishing ethics.**	**AL4**	**Any decision Apple, Inc., has made is legal.**
CL5	I can lead an ethical life without the need of religion.	**AL5**	**Apple, Inc., sets the standard for patent protection.**
CL6	**My religious belief helps me to make ethical decisions.**	AL6	The lawsuit between Apple, Inc., and Samsung corporation is not relevant to me.
Social/ Institutional Definition	The influence and understanding of faith can be observed among a group of people, which is the sociological component of religion. The social identity may be recognized within a small group of people, or it may be in line with the society on a large scale.		
Scale derived from	Worthington et al. 2003; Thurston and Chave 1964		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CI1	**I make financial contributions to my religious organization.**	**AI1**	**Owning Apple products gives me a sense of belonging.**
CI2	**I enjoy working in the activities of my religious affiliation.**	**AI2**	**Seeing people use Apple makes me feel good.**
CI3	**I keep well informed about my local religious group.**	**AI3**	**I like to hang out with people who use Apple products.**
CI4	**I have influence in the decisions of my local religious group.**	**AI4**	**Owning Apple products makes me feel powerful.**
CI5	I enjoy my church because there is a spirit of friendliness there.	AI5	Steve Jobs was a very charismatic leader of Apple, Inc.
CI6	I believe the church is a powerful agent for promoting social righteousness.	**AI6**	**I am strongly supported by the Apple (online) community.**

Material Definition	This dimension contains buildings, architecture, arts, images, icons, and instruments of ritual.		
Scale derived from	Bader et al. 2005		
Item Number	**Catholic Items**	**Item Number**	**Apple Items**
CM1	**I often purchase books about religion.**	AM1	The Apple icon represents the technology industry.
CM2	**I purchase items from religious bookstores regularly.**	**AM2**	**I am a loyal customer of Apple, Inc.**
CM3	**I watch religious-themed shows and speeches frequently.**	**AM3**	**I find Apple products appealing.**
CM4	**I listen to religious-themed music daily.**	**AM4**	**Apple stores attract my attention.**
CM5	**I collect religious-themed items.**	AM5	I purchase Apple products (online) regularly.
CM6	I visit religious places at least once a year.	AM6	I am very familiar with Steve Jobs' speeches.
		AM7	I wish to own as many Apple products as I can.

**RC*: Reverse Coding
**Items in bold remained from Study 1 testing after the pilot study.

Study 1

Procedures

After the pilot study, the remaining 63 items of the scale were distributed through an online survey via Qualtrics for Study 1. The researcher collected the data through a Qualtrics data collection panel. The Qualtrics team sent the survey link to the subjects' emails and asked their willingness to participate. Question 21, which asked: "*To ensure you are reading the questions carefully, please select number two for this statement,"* was added and used as an attention check question in the middle of the survey to ensure participants were reading each question (Oppenheimer et al. 2009). Responses were excluded if this question was answered

incorrectly. The first page of the Qualtrics survey is in Appendix A, followed by the second page of filtering questions in Appendix B. After the filtering and demographic questions, participants started with the Catholic scale questions, then the Apple scale questions.

Samples

To increase the representativeness of the data, the survey was distributed in the Northeast, West, Midwest, and South regions of the U.S. Survey participants had to be Catholic and had to use Apple products to qualify for the survey. The results of Study 1 are reported in the first section of Chapter V.

Study 2

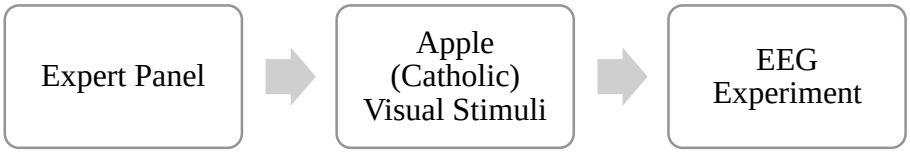


Figure 11. Three Stages in Study 2

There were three stages in Study 2 (See Figure 11): Expert panel, selection of Apple (Catholic) visual stimuli, and the EEG experiment. The purpose of the expert panel was to objectively select the visual stimuli that were used for the EEG experiment. The EEG experiment was composed of nine steps (see Table 5). In the EEG experiment, a set of Catholic and Apple visual-image stimuli were displayed on a computer screen while participants' brain waves were recorded in another computer. Lynch et al. (1974) found that visual feedback provides evidence of learning. The visual image stimuli were used to test whether devotees reacted similarly to images of Catholicism and Apple, since the purpose of this research is to examine whether Apple

is a religion on the basis of the theoretical framework. Using visual stimuli helped clarify and measure, specifically and through the theoretical framework, devotees' reactions in Alpha waves to each dimension of Catholic and Apple stimuli. The processes of the expert panel are explained in the next section. Once the visual image stimuli were selected, the EEG experiment was conducted.

Expert Panel

An expert panel (Ohme et al. 2010; Smith and Gevins 2004) was used to select final visual images that were used later in the EEG experiment. The aim for the expert panel was to choose a set of visual images based on the definitions of the seven dimensions of religion (Smart 1989) that both the Catholic and Apple experts agreed upon. The researcher guided the expert panel through two separate Qualtrics online surveys. Five Apple experts evaluated twenty-eight Apple visual images in one Qualtrics online survey. Five Catholic experts evaluated twenty-eight Catholic visual images that were embedded in the other Qualtrics online survey.

Catholic experts, who have been practicing Catholicism for at least twenty years (Table 3 demonstrating their experiences), are not identical to the Apple experts, who have used Apple products for twenty years on average (Table 4 demonstrating their attitude and experiences). All the experts evaluated their level of devotion to Apple and Catholicism separately above eight in the Likert Scale (1=Least Devoted; 10=Most Devoted). Experts remained anonymous and were represented by assigned names that were coded by the researcher.

Table 3. Experience of Catholic Experts

	Catholic Experts	**Years of Practicing Catholicism**	**Experience**
1	Jenny	56	She loves the faith. She rated herself a 10 in the devotion scale.
2	Ann	37	"I've been a Catholic all my life, but I could say four years ago was when I became more involved with the church."

3	Edith	34	She was raised as and is a devout Catholic.
4	Helen	30	She is a life-long church member. Currently she is an ordained minister.
5	John	21	"I converted to Catholicism in 1993, and I've been teaching adults and high school kids for 15 years." He rated himself 10 in the devotion scale.

Table 4. Experience of Apple Experts

	Apple Experts	**Years of Using Apple Products**	**Experience**
1	Denny	37	His first Apple had 4 kilobytes of memory with a TV for the monitor and a cassette recorder for mass memory. It cost approximately $3,000 in 1977. In total, he has owned 10 computers he personally purchased; seven he asked the school to pay for. In addition, he has owned 2 iPads, 1 iPod, 1 inkjet printer, 1 laser printer, 1 digital camera, 3 wireless routers, 1 20-gig hard drive, all OSX systems, 4 editions of Final Cut Pro, 2 editions of iLife, 3 editions of iWork. He is also familiar with database software, utility software, web server software, web design software, and a myriad of cables, connectors, and adapters. "Nothing short of being a fantastic introduction to Apple desktop computers."
2	Laura	34	She has owned more than ten but fewer than thirty Apple products.
3	Sam	22	He has in general been very pleased with desktops, laptops, iTouch, and iPads. He has owned roughly 15 Apple products.
4	Caroline	7	"I do not have a bad thing to say about my experience with Apple. Any time I have had a problem with my phone or computer, Apple has been more than willing to help! The Apple name is one I trust and stand by. Apple makes tech-savvy products that are built for the everyday consumer."
5	Wendy	35	Since the launch of Apple iPhone 3 in June 2012, she has become very loyal to Apple, even after a short period of time.

Visual Image Stimuli

The images for the visual image stimuli were selected by the researcher from Pinterest (www.pinterest.com), a website where members collect pictures with specific categories of their personal interests. Data collected in September 2014 showed that 42% of U.S. adult women and 13% of adult men use Pinterest (Digital Marketing 2015). Based on statistics from Google Image, participants may be less likely to see visual images from Pinterest in online searches.

Google accounted for 75.2% of the U.S. search market in January 2015, and 87.1% in mobile phones by March 2014 (Digital Marketing 2015). The visual images selected from Pinterest for this study were therefore different from the images that are available on Google Image searches. The researcher first chose four images for Catholic and Apple stimuli that met the definition of the seven dimensions, then the expert panel provided recommendations for the final visual images that would be used in the EEG experiment.

Processes of Expert Panel

The definition of each dimension was provided on top of each image. The online Qualtrics Apple (Catholic) survey with four visual images in seven dimensions was demonstrated in the following way:

Thank you very much for your time evaluating this expert panel survey. This research is conducted by Yi-Chia Wu, Ph.D. candidate in Marketing at The University of Texas–Pan American. This online survey is part of my dissertation about religious consumption. On the following page, you will see the definition of the Seven Dimensions of Religion proposed by Ninian Smart (1989). I use the Apple (Catholic) context to see if these pictures fall into Smart's Seven Dimensions. Please read the definition of each dimension first, and then evaluate whether each picture falls into a dimension with a Likert scale (1=Strongly Disagree; 10=Strongly Agree). There are four pictures for each dimension. This survey will take less than 10 minutes to complete. Thank you for your advice.

The ritual/practical dimension: includes regular worship, praying, and marching (for religious purposes). This dimension is particularly important to faith in the form of a sacrament.

This picture fits in the ritual/practical dimension.

	1	2	3	4	5	6	7	8	9	10	
Strongly Disagree	❍	❍	❍	❍	❍	❍	❍	❍	❍	❍	Strongly Agree

Please provide comments if any.

The Catholic expert panel was conducted the same way, but with Catholic visual images only. Each image was demonstrated in the same format shown above. Four images were shown for each dimension; i.e., ritual, emotional, narrative, philosophical, ethical, institutional, and material in both Catholic and Apple expert panel surveys. The two out of the four images that received the highest and second highest scores by adding up the Likert scale score (1=Strongly Disagree; 10=Strongly Agree) were used in Study 2.

Figure 12. Catholic Visual Stimuli

Catholic Practical/Ritual Dimension

Catholic Experiential/Emotional Dimension

Catholic Narrative/Mythic Dimension

Catholic Doctrinal/Philosophical Dimension

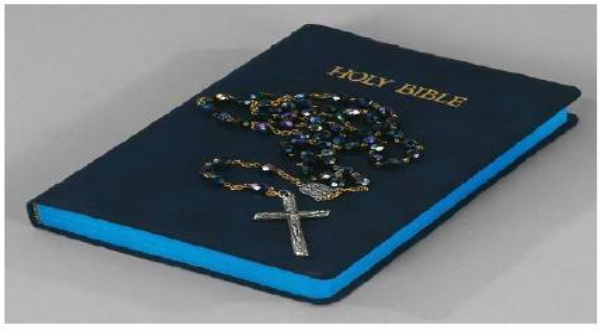


Figure 12. Catholic Visual Stimuli Cont.

Catholic Ethical/Legal Dimension

Catholic Social/Institutional Dimension

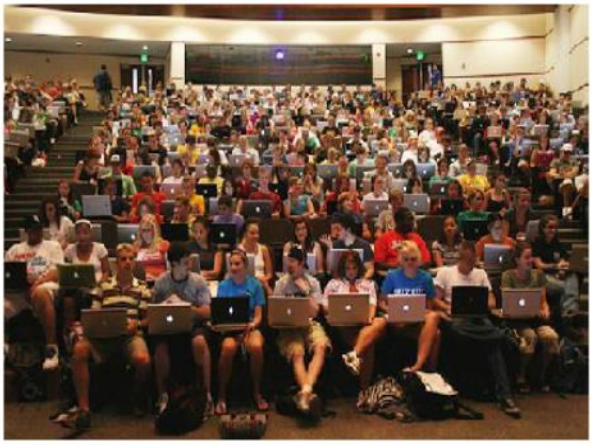
Catholic Material Dimension

Figure 13. Apple Visual Stimuli

Figure 13. Apple Visual Stimuli Cont.

Apple Ethical/Legal Dimension

Apple Social/Institutional Dimension



Apple Material Dimension

Images that received low scores are not shown here because they were not used for the visual image stimuli. In addition, experts' reasons were considered regarding fitness and appropriateness for including and not including each of the visual stimuli. Figure 12 and Figure 13 demonstrate the visual images agreed upon by Catholic and Apple experts in two different Apple and Catholic surveys. The data collection timeframe for the expert panel of Catholic visual-image stimuli was from March 30 to April 4, 2014; and that of the Apple visual-image stimuli was from March 27 to April 3, 2014.

Electroencephalogram (EEG)

There are two types of EEG brain wave analyses: Non-hemispheric brain wave analysis and hemispheric lateralization (Wang and Minor 2008). Klebba (1985) suggests that non-hemispheric brain wave analysis be applied to measure consumers' cognitive changes in their brain activity. Marketing studies use this method to measure consumers' immediate reactions in advertising, branding, and packaging (Wang and Minor 2008). Brain wave peaks indicate cognitive information processing (Young 2002) in marketing studies.

Hemispheric lateralization, differing from non-hemispheric brain wave analysis, focuses on the differences in the left- and right-brain hemispheres when reacting to external stimuli (Young 2002), rather than just the process of brain activity. More importantly, Klebba (1985) indicates that only 15 percent of hemispheric dominance can be explained, and therefore the explanatory power is very low. The other drawback of this method is the limited generalizability in Sperry's (1973) findings, which were the foundation of hemispheric lateralization in marketing studies. Individuals who are right- or left-handed had to be filtered for this type of method to find consistent results; i.e., all participants were right-handed. The findings with the right-handed participants can not apply to the left-handed population (Klebba 1985).

Therefore, this research adopted the hemispheric lateralization method because I wanted to explore the occurrence of Alpha waves when reviewing stimuli rather than the inter-correlation between right and left hemispheres.

This study used an EEG to measure participants' brain waves while they viewed visual stimuli. The EEG uses electrodes located on the scalp to demonstrate electrical activity in the form of brain waves (Milosavljevic et al. 2008) that provide a stochastic signal indicating the general mental state of an individual. The EEG has a lower spatial resolution (2 centimeters) but better temporal resolution (1/1000 of a second), as well as lower invasiveness and usage and purchase cost than the fMRI (Milosavljevic et al. 2008).

Selection of EEG Sites

The placement of EEG sensors was based on the International 10-20 electrode system (Jasper 1958). Cz (marked yellow in Figure 14, left) was an unambiguous localization of the vertex point, where "z" means zero (Oostenveld and Praamstra 2001). The placement of Cz did not capture brainwaves. Rather, Cz detected the motor sensor, which indicated the subject's body stability during the experiment. To localize Cz, the measurement started from nasion (Nz) and ended at the inion (Iz) where the midpoint of the total length met the midpoint of the preauricular point (see Figure 14, right) from the left ear to the right ear. Therefore, Cz was placed with the ground electrode. Fz and Pz were at 20% front and back, out of the total length from nasion to inion, from Cz (see Figure 14, right). Both were placed with active electrodes (marked blue in Figure 14, left). A1 and A2 were placed with linked-ear references (marked gray in Figure 14, left). Fz, where the frontal lobe is located, measured the brainwaves involved with executive functions; Pz, where the parietal lobe is located, produces an Alpha wave that deals with the mental calmness state of mind.

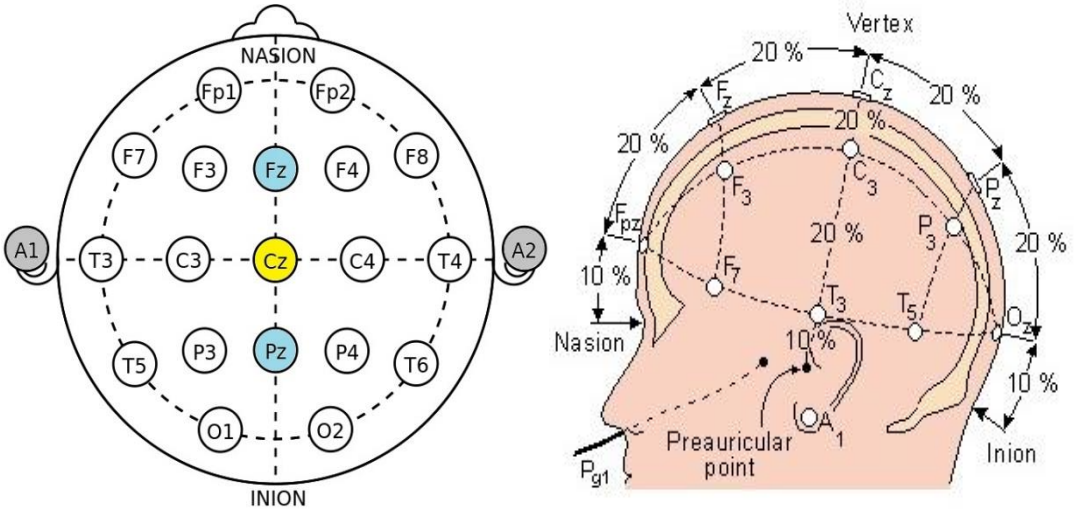


Figure 14. The International 10-20 System (Malmivuo and Plonsey 1995) and Fz-Cz-Pz Measurement

EEG Experiment Setup

Therapist Linda Walker, who is Biofeedback Certification International Alliance (BCIA) certified in neurofeedback, trained the researcher over 16 hours of sessions, including the placement of sensors, artifact detecting, and script design for the visual stimuli.

This research used a bipolar montage (Tetler 2001) recording with a Thought Technology ProComp 2 encoder that was embedded with Infiniti 6.3 software to record EEGs during the experiment. Two active electrodes were placed at location Fz and Pz with a linked-ear reference (A1-A2). Electrode placements on Fz-Cz-Pz will be introduced in the next section. Two channels were sampled at 256 samples per second and the notch filter was at 60 Hz.

Figure 15 demonstrates the setup of the EEG experiment. Two separate monitors were connected to the computer: Monitor 1 recorded EEGs with Infiniti 6.3 software designed by Thought Technology; Monitor 2 showed Catholic and Apple stimuli during the experiment with a video camera for recording participants' facial reactions. Participants could only see the visual stimuli on Monitor 2 and could not view the EEG recording on Monitor 1.

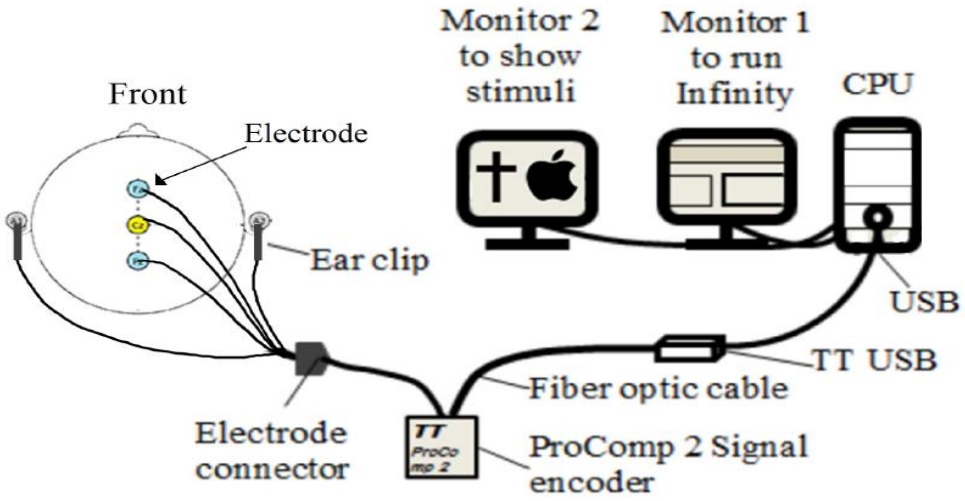


Figure 15. EEG Experiment Setup with Thought Technology ProComp 2 Encoder. This figure was modified based on Aurup and Akgunduz (2012).

Selection Samples of EEG Participants

The online survey link was also sent to UTPA students by convenience sampling. Considering that EEG participants for Study 2 had to take the online survey first, it was necessary for EEG participants to be present for Study 2.

On the introduction page of the online survey, there was a paragraph informing participants that they would be asked at the end of the survey if they were willing to participate in the second study, the EEG experiment. At the end of the online survey, the following question appeared: "Are you interested in participating in phase 2 of the research, which includes an EEG reading while viewing religious and Apple pictures?" If participants chose "Yes," then they were asked to leave their name and email. If participants chose "No," then the survey ended.

After one week, the online survey participants were contacted by email asking if they were willing to participate in the second phase of the study (Appendix C). Participants who were confirmed for the EEG experiment were scheduled through Doodle, an online scheduling website. Once they selected their preferred time and date, a reminder email was sent before the

experiment (Appendix C). In the email, each participant was reminded of the schedule and informed of the location (UTPA College of Business Administration, Room 117) for the EEG experiment. The researcher requested that each participant wash and dry their hair before their selected date and asked them not to apply any hair products, because dryness of the scalp enhances the accuracy of EEG signals.

The EEG experiment lasted for 50 minutes per subject. Each participant was given a $10 Starbucks gift card after completion of the experiment to compensate them for their time. According to Institutional Review Board (IRB) guidelines, participants had to be over 18 years old and U.S. resident aliens or citizens to accept the gift card. If participants were international students, the acceptance of a $10 gift card could possibly endanger their working status and they would face the risk of deportation. However, international students are allowed to work 19 hours or fewer per week, and by accepting the $10 gift card they would not be violating the maximum working hours per week (20 hours). In order to avoid this risk that participants might face, a notification was stated at the beginning of the online survey, which read:

There are two phases of this study. At the end of the survey, you will be asked to provide your name and email if you agree to participate in the second study. You will receive a $10 Starbucks gift card for your participation in the second study. In order to be eligible to participate in the second study, you must be at least 18 years of age or older and must be a U.S. Citizen or Legal Permanent Resident. If you are not, please do not complete the survey for the second study, or notify the researcher.

EEG Experiment

When the participant came for the EEG experiment, the researcher reconfirmed their working status before the experiment began. Each participant was given a “tax notice” form

notifying him or her of tax responsibilities after receiving the gift card. This process is required by the IRB.

Video Recording

The purpose of video recording was to ensure that each participant viewed the visual stimuli with their full attention. Since the researcher would not be able to see each participant's facial expressions, there was a video camera installed on top of the computer monitor. The researcher asked each participant to sign a videotape release form (Appendix D) requested by the IRB before videotaping. The researcher used an additional computer monitor to record during the experiment.

Script

There were two scripts designed after the visual stimuli were chosen. Both scripts started with a four-minute baseline and lasted for 7 minutes 44 seconds total (see Figure 16). The first script started with the Catholic stimuli, followed by the Apple stimuli. The second script started with the Apple stimuli, followed by the Catholic stimuli. Each Apple and Catholic stimulus consisted of images corresponding with the seven dimensions of religion. Seven colors were used under the Apple stimuli and Catholic stimuli (with each color representing one dimension) and each dimension included two visual images, selected by the expert panel. Alpha waves were measured and recorded for each dimension. Each visual image appeared for six seconds and was followed by a black screen, which lasted for two seconds (see Figure 17 as an example for the "Social/Institutional" dimension).

In this four-minute timeframe, each participant saw a small blue dot appear on the computer screen monitor and remained awake, sitting still in a chair. After a four-minute baseline recording by the EEG, an instruction screen appeared and read:

Instructions:

In this experiment, you will see a series of pictures. In between each picture, you will see a black screen (2 seconds). Once you start viewing the pictures, please pay attention to the content of each picture (6 seconds) and think about the meaning of what you see. Try not to blink your eyes when viewing the pictures. This experiment will last around 10 minutes. Please sit still during this experiment.

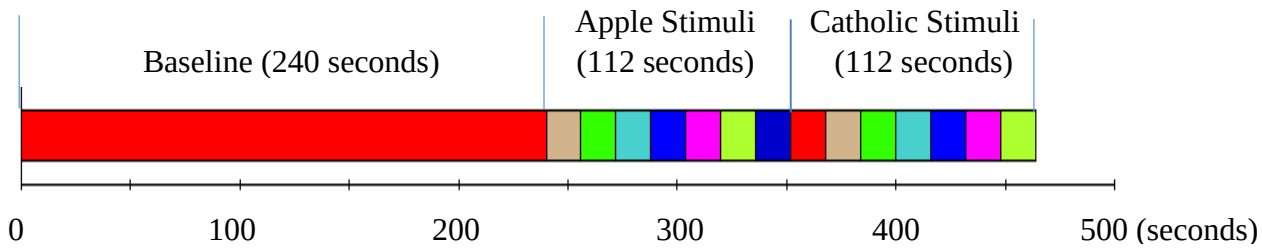


Figure 16. Script of Apple-Catholic Stimuli

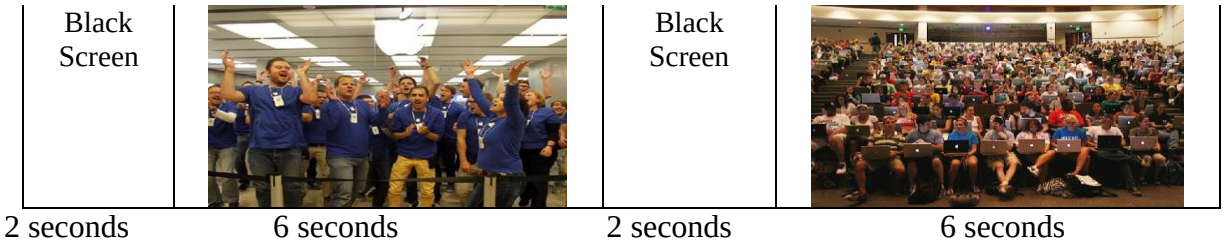


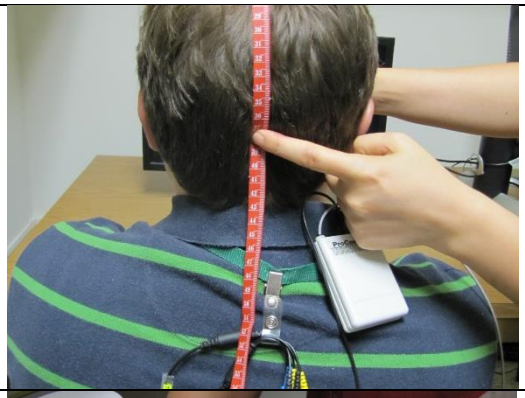
Figure 17. Time Arrangement in Apple's "Social/Institutional" Dimension

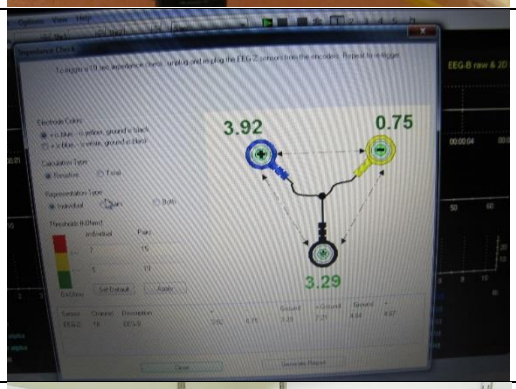
The first and second scripts rotated continuously among participants. For example, the first participant viewed the first script and the second participant saw the second script. The same rotation followed to the next participant with the same pattern. That is, counterbalancing the order of Catholic and Apple stimuli was used in the EEG experiment.

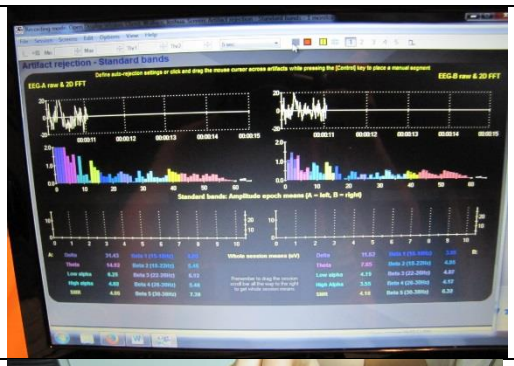
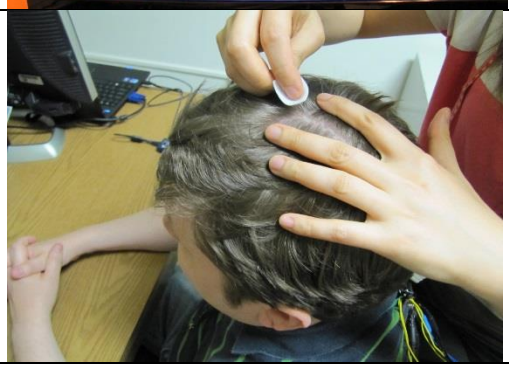
Steps of the EEG Experiment

After the participant arrived, the procedure was explained to them, and then they signed the consent form. Next, the researcher used alcohol pads to clean the scalp on Fz-Cz-Pz and earlobes (Figure 14, left) and then Nuprep skin preparation gel was applied on the same spots, followed by Ten20 EEG conductive paste attached to the EEG electrodes. Nuprep skin preparation gel is used to enhance test results. Ten20 EEG conductive paste aims to increase adhesiveness and conductivity and to reduce skin impedance in the non-disposable neurodiagnostic electrodes. Table 5 illustrates the steps of EEG experiments with pictures.

Table 5. Steps of EEG Experiment

Steps	Process of EEG preparations and execution	Pictures
1	The researcher explained to each participant that an EEG study is neither an instructive measurement nor a medical examination. Participants could ask to stop any time during the experiment.	
2	The participant read and signed the consent form.	
3	The researcher measured three spots (Fz, Cz, and Pz) on the participant's head.	
4	The researcher used an alcohol pad to clean three spots on the head and earlobes, then applied Nuprep to the same spots.	

5	The researcher placed EEG sensors on Cz and active sensors on Fz and Pz with Ten20 to secure the location.	
6	The researcher placed linked-ear references on the earlobes with Ten20 to secure the location.	
7	Impedance check for Fz-Cz-Fz, A1, and A2 had to be below 5 kΩ (shown in green), before the EEG recording.	
8	The researcher instructed the participant to sit still in order to record a baseline of brainwaves for four minutes, followed by experiment instructions, and then the visual images appeared on the computer screen monitor. The video camera started recording once the experiment was initiated.	

9	Recordings of participants' brainwaves were captured by a different computer.	
10	The researcher used alcohol pads to clean and remove Ten20 applied to the surface of the skin after the participant finished viewing each script.	
11	The participant was debriefed and the EEG experiment ended.	

CHAPTER V

DATA ANALYSIS AND FINDINGS

Study 1

A total of 708 surveys were collected in Study 1. Participants were located in the Northeast (23.4%), West (20.9%), Midwest (21.9%), and South (33.7%).

Table 6. Sample Demographics

Gender	**Frequency**	**Percent**
Male	264	37.3%
Female	444	62.7%
Average Age	35.6	
Region		
Midwest	155	21.9%
Northeast	166	23.4%
South	239	33.7%
West	148	20.9%
Household Income		
Less than $25,000	95	13.4%
$25,000-$34,999	93	13.2%
$35,000-$49,999	105	14.9%
$50,000-$74,999	201	28.4%
$75,000-$99,999	117	16.5%
More than $100,000	96	13.6%
Education Level		
Graduated high school or equivalent	109	15.4%
Some college, no degree	183	25.8%
Associate degree	103	14.5%
Bachelor's degree	228	32.2%
Post-graduate degree	85	12.0%

Table 6 demonstrates the demographics of the total samples. This survey was distributed to the four main areas in the U.S. from May 16, 2014 to August 14, 2014. There were a total of 65 questions in the main study. Bagozzi and Yi (2012) suggest that the ratio of the number of questions to survey participants should be 1:10. This study reached the requirement of this ratio. In order to achieve generalizability, this research included not only student samples, which has the drawback of homogeneity, but also other Catholic and Apple users residing in the four main areas of the United States.

EFA and CFA were performed in Study 1 (see below). The purpose of Study 1 was to evaluate Catholic and Apple devotees' devotion based on their self-reports. In Study 1, participants were assigned to four groups, which were divided by their levels of devotion through summed Catholic and Apple scales in preparation for Study 2. The basis of Study 2 was to measure Catholic and Apple devotees' Alpha waves in reaction to visual stimuli to examine whether Apple is similar to Catholicism in terms of religion. This research conducted a one-way ANOVA for between-group comparisons for Study 2, the EEG experiment.

Exploratory Factor Analysis

Exploratory Factor Analysis (EFA) was conducted to extract factors of the online survey based on the items extracted from the pretest. A Promax rotation with Principal Components was performed due to the correlation between dimensions in nature (Fabrigar et al. 1999; Hair et al. 2013). Kaiser-Meyer-Olkin (KMO) tests of sampling adequacy and Bartlett tests of sphericity (Bartlett 1954) were conducted in order to provide statistical evidence that the data were acceptable to proceed toward factor analysis. The KMO measure value is 0.971, which meets the threshold of 0.6 (Pallant 2010) and is above .9, which indicates a great suitability for analysis (Kaiser 1974). A significant test result of Bartlett tests of sphericity rejects the null hypothesis

that there is no correlation among variables. The Catholic scale produced a significant Bartlett test of sphericity (p = .000).

Three items were excluded from Study 1 after conducting an EFA. Item CR14 (I pray every day without the need to go to Mass) was excluded because this item did not load in any one of the generated factors. CE3 (Religion is relevant to my deepest feelings) and CI4 (I have influence in the decisions of my local religious group) were removed due to cross-loading. CR7 (I pray the rosary every day) and CR13 (I pray to Saints) were removed because neither item loaded at all. Cronbach's Alpha for the three new extracted factors was above .7 (Hair et al. 2013). All the factor loadings were above the threshold of .5 except CE2 (I enjoy working in the activities of my religious affiliation), which had a factor loading of .47.

Five items were excluded from Study 1 after running an EFA. Item AR3 (I do not like Apple, Inc., so I do not care to buy any Apple products) and AR7 (I really worship Apple, Inc.) were removed due to a low inter-item correlation, which was less than the threshold of .2 (Bearden et al. 2001). In addition, the theoretical reason to remove AR7 was based on the similar semantics of AR5 (I only use Apple products). AD3 (The simplicity of Apple products is the source of Apple's growth) and AL2 (I don't think Apple, Inc., is truthful to its customers) were excluded due to cross-loadings after several tests using the Promax rotation. AL1 (Apple does not cheat its customers.) and AN4 (I am totally captivated by the stories about Apple.) were removed because neither item loaded at all.

Reliability for the Apple Scale

The final Cronbach's Alpha for the four new extracted factors of the Apple scale was above .7 (Hair et al. 2013). Factor loadings should be at least .5 but preferably .7 or higher (Hair et al. 2010). All of the Apple scale factor loadings were above the threshold of .5 except AL1

(Apple, Inc., does not cheat its customers). However, its factor loading of .45 was fairly close to the threshold. Factor loading for each item is shown in Table 7.

Confirmatory Factor Analysis

After running EFA, the Catholic scale generated three factors, whereas the Apple scale generated four factors. The three factors in the Catholic scale involved 17, 5, and 5 items, while the four factors in the Apple scale involved 12, 7, 3, and 3 items separately. Table 7 demonstrates the factor loadings using AMOS 22.0 for each item with all 7 factors from the Catholic and Apple scales, along with Cronbach's Alpha, construct reliability, and average variance extract (AVE) to test for convergent validity.

Table 7. Factor Loadings of Catholic and Apple Scales, AVE, CV, and Cronbach's Alpha

		Standardized Factor Loadings	AVE	Construct Validity	Cronbach's Alpha
Catholic Religiosity			0.67	0.971	0.971
CD1	I spend time trying to grow in understanding my faith.	0.839*			
CD3	The Ten Commandments of The Bible are what I believe in.	0.807*			
CD5	I believe God created the universe.	0.763*			
CE4	Any spiritual experience could be considered a sign connecting with God.	0.688*			
CE5	Believing in my religion is comforting.	0.845*			
CE6	My religious belief makes me feel secure.	0.875*			
CE7	I have felt the presence of God.	0.783*			
CL1	Religion is concerned with my greatest values.	0.907*			
CL3	My religious belief guides my judgment of right and wrong.	0.860*			
CL4	Religion is the foundation for establishing ethics.	0.839*			

CL6	My religious belief helps me to make ethical decisions.	0.888*			
CN2	The story of Jesus Christ shapes my belief.	0.909*			
CN3	I think the stories in the Bible are well documented.	0.824*			
CN4	I believe in the miracles written in the Bible.	0.875*			
CN5	The Creation Story in the Bible is a symbolic narrative of how the world began.	0.584*			
CN6	The stories in the Bible define who I am.	0.838*			
CR11	I pray every day.	0.717*			
Catholic Material			0.78	0.945	0.945
CM1	I often purchase books about religion.	0.891*			
CM2	I purchase items from religious bookstores regularly.	0.919*			
CM3	I watch religious-themed shows and speeches frequently.	0.904*			
CM4	I listen to religious-themed music daily.	0.853*			
CM5	I collect religious-themed items.	0.837*			
Catholic Rituals at Institution			0.68	0.912	0.912
CI1	I make financial contributions to my religious organization.	0.831*			
CI2	I enjoy working in the activities of my religious affiliation.	0.917*			
CI3	I keep well informed about my local religious group.	0.917*			
CR2	I rarely go to church. RC	0.674*			
CR10	I go to Mass every week.	0.750*			
Apple Religiosity			0.63	0.957	0.957
AE1	I consider Apple products sacred.	0.715*			
AE2	My relationship with the Apple brand is real.	0.818*			
AE3	If I don't have my Apple products nearby, I feel a sense of emptiness.	0.787*			
AE4	I think about Apple, Inc., all the time.	0.783*			

AE5	I have a profound relationship with the Apple brand.	0.869*			
AI1	Owning Apple products gives me a sense of belonging.	0.884*			
AI2	Seeing people use Apple makes me feel good.	0.891*			
AI3	I like to hang out with people who use Apple products.	0.841*			
AI4	Owning Apple products makes me feel powerful.	0.889*			
AI6	I am strongly supported by the Apple (online) community.	0.841*			
AR5	I only use Apple products.	0.612*			
AR9	I often browse Apple's online store.	0.710*			
Apple Doctrine on Material			0.65	0.927	0.925
AD4	Apple products are always ahead of others in innovation.	0.786*			
AD6	Apple, Inc., creates products for creative types.	0.811*			
AE6	I love using my Apple products.	0.801*			
AM2	I am a loyal customer of Apple, Inc.	0.850*			
AM3	I find Apple products appealing.	0.872*			
AM4	Apple stores attract my attention.	0.789*			
AR4	I like the Apple brand.	0.710*			
Apple Narrative			0.72	0.887	0.887
AN1	The stories about Steve Jobs starting Apple, Inc., tell everything about the company.	0.836*			
AN3	I am affected by the stories about Steve Jobs.	0.874*			
AN5	Stories about Steve Jobs are inspiring.	0.842*			
Apple Legal			0.57	0.795	0.79
AL3	The legal issues against Apple, Inc., do not affect my opinions about the company.	0.610*			
AL4	Any decision Apple, Inc., has made is legal.	0.741*			
AL5	Apple, Inc., sets the standard for patent protection.	0.889*			

*p = .000

Jaccard and Wan (1996) suggest using fit indexes to measure the model fit, such as chi-square to the degrees of freedom (CMIN), RMSEA (Root Mean Square Error Approximation), CFI (Comparative Fit Index), and NFI (Normed Fit Index) for multiple examinations for the model fit. These values are presented in Table 8. CMIN is below the suggested threshold of 5 (Wheaton et al. 1997) that is considered adequate. RMSEA is below .08, which is considered adequate (Hair et al. 2006). CFI and NFI are less than ideal, as they are supposed to be above .9 as recommended (Hair et al. 2010). However, considering the Catholic scale, and especially the Apple scale, was developed by this study, lower CFI and NFI are expected.

Table 8. Test Results of Model Fit

Goodness-of-fit statistics	Model Fit
Chi-square/df (CMIN)	4.787
RMSEA	0.073
CFI	0.873
NFI	0.845

Convergent Validity

Convergent validity indicates the extent to which indicators of constructs share a high degree of variance (Bagozzi 1991). There are three ways to measure convergent validity (Hair et al. 2010): factor loading, average variance extract (AVE), and construct reliability (CR). The threshold for a standardized factor loading should be .5 or, ideally, above .7 (Hair et al. 2010). AVE is an indicator of convergence and is calculated as a mean variance from the items loading on a specific construct (Hair et al. 2010). All standardized factor loading was above .5 and the majority of them were above .7. An AVE above .5 suggests an adequate convergence. All seven factors fit within this criteria. Cronbach's Alpha evaluates the reliability; this is also an indicator of convergent validity. All the Cronbach's Alphas were above .7, which suggests good

reliability. Construct reliability, on the other hand, measures internal consistency. All the construct reliability measurements range from .795 to .971, suggesting that the items consistently represent the specific latent construct (Hair et al. 2010).

Discriminant Validity

The suggested method for testing for discriminant validity is when the AVE is greater than any of the two factors' squared correlation estimates (Hair et al. 2010). Discriminant validity is achieved if this relationship is valid. This explains more than the correlations between any of the two constructs. Table 9 shows results that indicate the seven constructs have discriminant validity.

Table 9. Discriminant Validity

Construct	1	2	3	4	5	6	7
1. Catholic Religiosity	**0.670**						
2. Catholic Rituals at Institution	0.666	**0.678**					
3. Catholic Material	0.436	0.629	**0.777**				
4. Apple Emotion at Institution	0.112	0.195	0.296	**0.652**			
5. Apple Doctrine on Material	0.125	0.106	0.116	0.551	**0.647**		
6. Apple Narrative	0.174	0.163	0.194	0.616	0.493	**0.729**	
7. Apple Legal	0.120	0.121	0.189	0.567	0.557	0.475	**0.571**

Values below the diagonal are squared correlations between constructs. Diagonal elements in bold are AVE.

Study 2

In Study 2, 63 subjects participated in the EEG experiment. Three participants were excluded. The EEG artifact section below explains specific reasons for each excluded participant. Therefore, a total of 60 qualified EEG participants (Male = 21, Female = 39, Average Age = 29.6, S.D. = 8.81) were analyzed in Study 2. Each EEG participant took Study 1's online survey before the EEG experiment. Based on their self-reporting in terms of their level of devotion, they were assigned to one of four groups based on the sum of the online survey

(1=Strongly Disagree; 10=Strongly Agree). EEG participants' online surveys using median-split (Barone et al. 2007) of the total summed Catholic and Apple scales were 173 and 216. If one's online summated score was higher than 173 for the Catholic scale and higher than 216 for the Apple scale, the participant was then assigned to Group 1 (Figure 18), representing high levels of devotion to both Catholicism and Apple. The same logic applies in the assignment of participants to Group 2. That is, if his or her online summated score was higher than 173 for the Catholic scale but lower than 216 for the Apple scale, the participant was then assigned to Group 2 (Figure 18), which represents high levels of devotion to Catholicism but low levels of devotion to Apple. Each participant was assigned to Group 3 and 4 in Figure 18 by using the same median-split method.

There were a total of 60 participants in the four groups: Group 1 (13 participants), Group 2 (17 participants), Group 3 (17 participants), and Group 4 (13 participants).

		Apple	
		High	Low
Catholic	High	13 (Group 1)	17 (Group 2)
	Low	17 (Group 3)	13 (Group 4)

Figure 18. Study 2—Apple Group vs. Catholic Group

Sample Size in Neuromarketing Research

According to Robert Knight, a neuroscientist at the University of California, Berkley, "small sample sizes are standard in clinical EEG studies because brains react in a remarkably

uniform way to the same stimulus" (Lawton and Wilson 2010, p. 2). "Considering sample size in the EEG study is irrelevant because a brainwave is measured subconsciously and human brains have not changed in the past 10,000 years. Human brains are much more similar than different" (*c.f.* Smith 2012, p. 42). Additionally, "the norm in cognitive neuroscience is a sample size between 15 and 20 participants. In communication research using EEG data, sample sizes range between 10 and 30" (*c.f.* Morey 2013, p. 194).

The sample size for EEG studies remains small from 2000–2011, with an average sample size of 26 (Wu 2012). After conducting an extensive search, I discovered 57 studies in which EEG data was used for scholarly marketing research from 1970 to 2014. Studies focused solely on brain development in the medical discipline were excluded from the literature search on EEG sample size. The average number of subjects for scholarly marketing studies was 23. There are two distinct time periods in which there was notable activity in this area (Figure 19). Appendix F lists the detailed authors, years of publication in each journal, and samples used in these 56 EEG marketing studies from 1971 to 2014. The first period lasted from 1971 to 1990—during that time, 10 academic studies were published. The smallest study had one subject (Krugman 1971), and the largest had 40 (Cacioppo and Petty 1982). The average for all studies of that period was 23. No relevant EEG study was found from 1990 to 2000. The second period began in 2000 and continues to the present study date, 2014. During that period, there were 47 studies, and the average number of subjects was 24. For the past 44 years, sample size in neuromarketing studies have not changed much. The smallest study in the second period had 4 subjects (Kim et al 2012), and the largest had 100 (Young 2002). In his study, Young (2002) used a "dry" EEG headset. There is no need to apply conductance paste on sensors to use a dry EEG headset and therefore it is much more time-efficient and easy to use.

This study had 60 participants in the EEG experiment. Compared to other neuromarketing studies from the past four decades, this sample size is fairly large (Figure 20). It is important to mention the studies of Silberstein and Nield (2008; 2012) with 198 and 110 subjects separately were not included. They used Steady-State Topography (SST), a type of EEG method measuring brain waves that focuses on Event-Related Potential (Wang and Minor 2008), which is different from the EEG analysis used for this study. In Silberstein and Nield (2014), there were eight subjects viewing the same stimuli in the same room with one monitor connected to eight EEG caps. This technique is not commonly used, but is technically possible for EEG studies. Even including Silberstein and Nield's (2008; 2012) studies, the average sample size remains small (n=29) from 1971 to 2014. As demonstrated in Figure 19, it is not the norm for EEG studies to have large sample size.

Because human brains are more similar than different, an increase in sample size does not dramatically increase the power of the study. The sample size of the EEG study therefore is not equivalent to traditional survey research that requires a large sample size to gain power. As such, the ratio of items to samples using a 1:10 rule of thumb (Hair et al. 2006; Bagozzi and Yi 2012) does not apply to the EEG sample size.

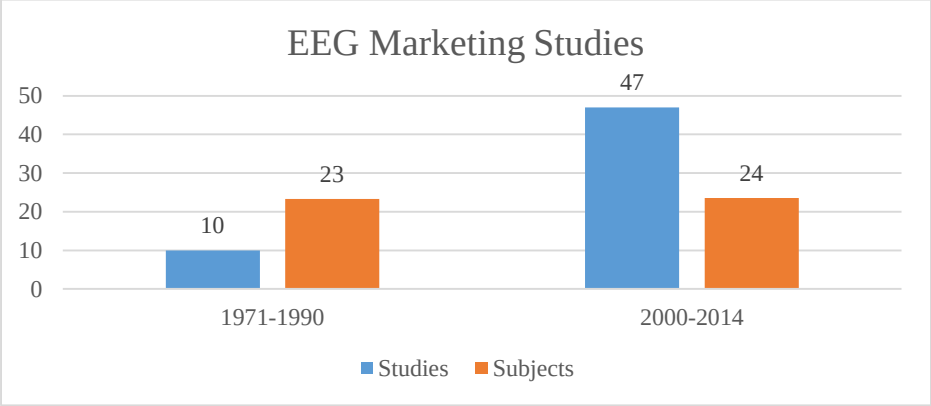


Figure 19. EEG Marketing Studies and Sample Size from 1970-2014

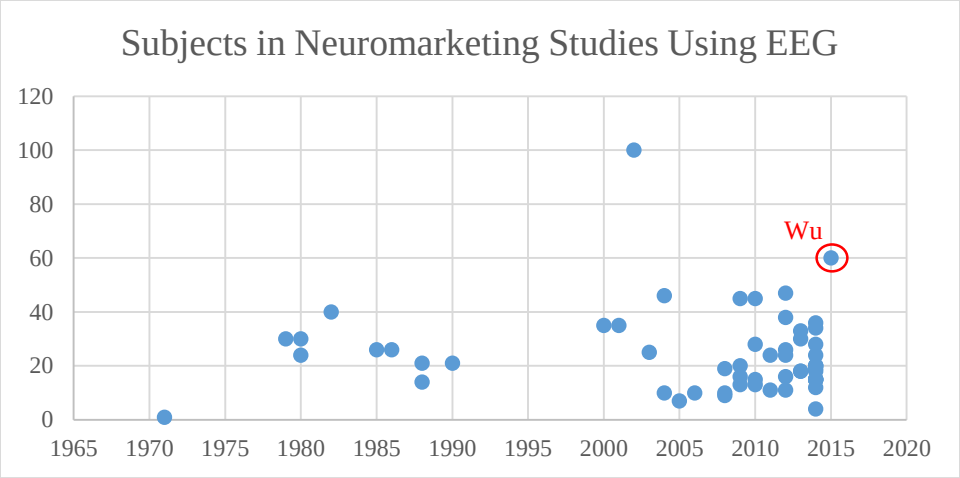


Figure 20. Subjects in Neuromarketing Studies Using EEG

Power Analysis

The researcher used G*Power 3.1.9.2, a statistical program commonly used for power analysis in social and behavioral research, to evaluate sample size, effect size, and the achieved power (Faul et al. 2007; Fritz et al. 2012; Indira et al. 2012) for Study 2. The numbers of subjects in Group 1, 2, 3, and 4 are 13, 17, 17b, and 13. The effect size is f = .8136. The effect size has large effects (threshold = 0.4) according to Cohen's standard (1988). The total sample size is 60 in four groups. The achieved power (1-β) is 0.9997. The same process of power analysis was measured and also recorded for Alpha waves while participants viewed the Apple stimuli. The numbers of subjects in each cell remained the same. Alpha waves responding to Apple stimuli were different. The effect size (f) is 0.673 and the achieved power (1-β) is 0.9938. Both Alpha waves responding to Catholic and Apple stimuli achieved satisfactory power with the total sample size of 60.

EEG Analyses

This research used Infiniti 6.3 software in coordination with ProComp 2 manufactured by Thought Technology Inc. to record EEG data. The Alpha, Beta, Gamma, and Theta waves were recorded and exported to a Word file. Since Catholic and Apple stimuli were counterbalanced and displayed from each EEG participant, the EEG recordings were first reorganized under the same stimuli.

EEG Artifacts

The artifacts for each participant were examined on Fz and Pz sites. More than half of the participants had more than 50 percent artifacts on Fz, and the remaining time exclusive of artifacts was not enough to conduct further analysis using data from Fz. For instance, there were 168 seconds (6 seconds of each picture, 28 pictures) of Catholic and Apple stimuli that each participant was exposed to, exclusive of 56 seconds of blank screens (2 seconds of each, 28 blank screens). If a participant's artifacts surpassed 25% of the total actual stimuli (168 seconds) of Fz or Pz, the data from either site was not usable. After examining the 63 participants, the researcher examined the Alpha waves located in Pz only, because the artifacts on this site were less than 25%. However, three of the EEG participants were still excluded in the final subject analysis pool. The reasons are explained below.

In the middle of the experiment, the researcher noticed that participant #8, coded by the researcher, was not able to pay attention to the visual stimuli as expected. After the EEG recording, the subject informed the researcher that a lack of sleep on the night prior to the experiment interfered with their attention in regard to the stimuli, and it was reflected on the EEG recording as well as the video recording. For this reason, participant #8 was excluded from the final EEG analysis.

The second exclusion of the EEG subjects was participant #12. There were no sign of Alpha waves during the entire EEG recordings. This mental state is abnormal, which may be due to the subject's mental condition or medication intake. Considering this irregular condition, participant #12 was excluded from the final usable subject pool.

Normal Alpha waves range between 8-10 Hz (low Alpha) and 10-12 Hz (high Alpha). Participant #44, the third exclusion, was excluded due to an abnormally high Alpha wave—22 Hz on average. When one is awake and in a relaxed state, Alpha waves fluctuate within the normal 8-12 Hz range. Alpha waves above the normal range, such as 22 Hz, typically occur when one is sleeping (eyes closed condition). However, when participant #44 proceeded with the experience, there was no sign of sleeping over the period of study. The video recording showed that the subject viewed the visual stimuli, both Catholic and Apple. The abnormal Alpha waves demonstrated that even though the subject was awake and with eyes open when viewing the visual stimuli, there were no brain reactions to either of the stimuli. For this reason, participant #44 was excluded.

One-Way ANOVA

While viewing each dimension, each EEG participant's Alpha wave was recorded, as well as the average of Catholic and Apple seven-dimension stimuli in Alpha waves. Before conducting a one-way ANOVA, the skewedness, kurtosis, histogram, and Shapiro-Wilks test for normality were used to test the homogeneity of variances, and outliers using Boxplot and Q-Q plot. Each was examined using each participants' Alpha waves for the seven dimensions in Catholic and Apple stimuli. After visually examining Boxplot and Q-Q plot, there were some repetitive outliers in both the Catholic and Apple's seven-dimension stimuli in the exams. The researcher decided to maintain the outliers for the one-way ANOVA test because there would be

unequal numbers of participants in each group if outliers were excluded. In order to meet the assumptions of one-way ANOVA, the researcher transformed the Alpha wave and baseline to Log10, which is the most commonly used method in an EEG study, as compared to other transformations (Arruda et al. 2011). After the Log transformation, the Catholic and Apple Alpha waves were slightly positively skewed, but the skewedness and kurtosis were within an acceptable range (Hair et al. 2010). Even though the Catholic and Apple Alpha waves were not normally distributed, one-way ANOVAs were fairly robust (Lix et al. 1996), given the fact that the unequal numbers of participants per group were not too different. In addition, all Alpha waves were positively skewed in the same direction for both Apple and Catholic visual stimuli, so this non-normality is not as problematic (Sawilowsky and Blair 1992) as deviations from normality, particularly since the sample sizes (numbers in each group) are equal, or nearly equal. This is less so for unequal (unbalanced) group sizes. Indeed, if sample sizes are not small, even fairly skewed distributions can be acceptable and are not problematic, as long as the groups are similarly skewed (Sawilowsky and Blair, 1992).

This research used a one-way ANOVA to reduce the risk of a Type I error (Hair et al. 2010). Alpha means for between-group comparisons (Groups 1, 2, 3, and 4 respectively) were performed. Furthermore, in order to distinguish the influence from each dimension among various levels of devotion in the four groups, separate dimensions were compared individually between two groups with a one-way ANOVA (see Table 10).

Each participant's Alpha waves were measured and recorded for the seven dimensions. Each participant was also monitored with brain waves for four minutes as a baseline. Every individual has his or her own dominant Alpha frequency (Schwibbe et al. 1981), normally at about 10 cycles per second (Wieneke et al. 1980). These differences occur depending on one's

reactions to different conditions (Banquet 1973), age, thickness of skull, etc. The strength of Alpha waves is measured in amplitude. I compared each participant's changes in Alpha waves to their baseline reading as a percentage change. Thus the readings are relative to the individual's baseline rather than an absolute amplitude reading. When one experiences an increase in the strength of Alpha waves, individuals have described their experience as "feelings of relaxation" and a "pleasant affect" in their mental state (Nowlis and Kamiya 1970).

As each individual's baseline was different; the difference was compared with each dimension. For example, "Catholic Doctrinal – Baseline (%)" is equivalent to the Catholic Alpha waves minus the baseline and divided by the baseline times 100 to examine the percentage change after an individual viewed Catholic (Apple) stimuli (see Appendix X for detailed description). All of hypothesis testing was completed by evaluating the percentage change between the Alpha wave to the baseline in the Catholic (Apple) stimuli. Instead of simply comparing the absolute value of Alpha waves between two groups, the relative value and the change of the Alpha wave to baseline were analyzed. Therefore, this research measures the relative change, compared to the baseline, to measure one's reaction to each stimulus. Table 10 demonstrates the significant results of a one-way ANOVA.

The negative value means the Alpha waves are lower than the baseline, which was the period of time that participants sat in the chair without viewing stimuli while maintaining a conscious state of mind. Alpha waves are usually lower when one views stimuli because of the attention one directs to the stimuli. The level of relaxation depends on how one feels about the stimuli. Again, the comparison of each dimension focuses on the relative difference, not the absolute difference.

Table 10. One-Way ANOVA

H1b	**Group 3 (AD[e])**	**Group 4 (AI[f])**	**F**	**P-value**
Apple Material (%)[a] Dimension	-5.009[c] (7.902)[d]	1.032 (7.552)	4.472	.043**
H2b	**Group 2 (CD[g])**	**Group 4 (CI [h])**	**F**	**P-value**
Catholic Material Dimension (%)	-2.728 (5.729)	-7.813 (7.895)	4.190	.050**
H3b	**Group 2 (AI)**	**Group 3 (AD)**	**F**	**P-value**
Apple Ritual Dimension (%)	-4.221 (6.580)	-12.134 (8.994)	8.571	.006***
Apple Emotional Dimension (%)	-3.068 (5.961)	-8.937 (8.563)	5.379	.027**
Apple Average Dimension (%)[b]	-2.754 (3.937)	-7.234 (7.366)	4.891	.034**
	Group 2 (CD)	**Group 3 (CI)**		
Catholic Narrative Dimension (%)	-.420 (9.334)	-8.225 (8.960)	6.186	.018**
Catholic Legal Dimension (%)	-1.389 (6.388)	-8.570 (10.786)	5.579	.024**
Catholic Average Dimension (%)[d]	-2.721 (4.890)	-7.808 (8.982)	4.207	.049**

[a] The percentage change of Apple Material Dimension minus baseline divided by baseline
[b] The percentage change of average Alpha wave of Apple's seven-dimension stimuli minus baseline divided by baseline [c] Mean [d] Standard Deviation
[e] Apple Devotees; [f] Apple Indifferents; [g] Catholic Devotees; [h] Catholic Indifferents
****p < .01; **p < .05*

Hypothesis Testing

In the hypothesis testing, Apple (Catholic) devotees were expected to trigger higher Alpha waves than Apple (Catholic) indifferents when they viewed Catholic (Apple) stimuli. However, each dimension was also separately compared with a one-way ANOVA for hypothesis testing because the total Alpha waves might be offset due to the aggregated average.

When testing H1a, none of the Alpha waves' percentage change of Apple stimuli were statistically significantly different between Groups 1 and 2 (Group 1: HAHC; Group 2: LAHC). Therefore, H1a is not supported.

In testing H1b, the average percent change of Alpha waves in responding to Apple stimuli between Groups 3 and 4 (Group 3: HALC; Group 4: LALC) were not significantly different. However, the percentage change in the Alpha wave of the Apple Material Dimension was statistically significant: F (1, 28) = 4.472, p = .043 at the 0.05 significance level. Because the Apple Material Dimension is a component of the Apple stimuli, it is concluded that H1b is supported.

In testing H2a, none of the Alpha waves' percentage changes in reaction to Catholic stimuli were statistically significantly between Groups 1 and 3 (Group 1: HAHC; Group 3: HALC). Therefore, H2a is not supported.

For testing H2b, the difference in percentage change of averaged Alpha waves in responding to Catholic stimuli between Groups 2 and 4 (Group 2: LAHC; Group 4: LALC) was not significantly different. However, the percentage change in the Alpha waves of the Catholic Material Dimension was statistically significant: F (1, 28) = 4.190, p = .050 at the 0.05 significance level. Considering that the Catholic Material Dimension is a component of the Catholic stimuli, it is then concluded that H2b is supported.

In testing H3a, the different in percentage change of averaged Alpha waves in responding to Apple stimuli (H3a-1) and Catholic stimuli (H3a-2) between Groups 1 and 4 (Group 1: HAHC; Group 4: LALC) was not significantly different. Interestingly, none of the percentage change of Alpha waves in reaction to specific dimensions between Groups 1 and 4 was statistically significant. Therefore, H3a is not supported.

There were two scenarios tested in H3b: reactions to Apple stimuli (H3b-1) and Catholic stimuli (H3b-2). When reacting to Apple stimuli, the percentage change of Alpha waves in Ritual, F (1, 32) = 8.571, p = .006, Emotional F (1, 32) = 5.379, p = .027, and most importantly,

the Average F (1, 32) = 4.891, p = .034 between Groups 2 and 3 (Group 2: LAHC; Group 3: HALC) were significantly different. Two components of the seven dimensions and the total average of percentage change in Alpha waves were significantly different. However, Group 2 was expected to have lower Alpha waves than Group 3 because participants in Group 2 had low levels of devotion to Apple, whereas those in Group 3 had a high levels of devotion to Apple. The result was the opposite of what was expected. Therefore, H3b-1 is not supported in reaction to Apple stimuli.

In the second scenario, when reacting to Catholic stimuli (H3b-2), the percentage change of Alpha waves in Narrative F (1, 32) = 6.186, p = .018, Legal F (1, 32) = 5.579, p = .024, and most importantly, the Average F (1, 32) = 4.207, p = .049 between Groups 2 and 3 (Group 2: LAHC; Group 3: HALC) was significantly different. Two components of the seven dimensions and the total average of percentage change in Alpha waves were significantly different. Group 2 was expected to trigger higher Alpha waves than Group 3 because participants in Group 2 had high levels of devotion to Catholicism, whereas those in Group 3 had a low level of devotion to Catholicism. The result was expected. Therefore, H3b-2 is supported in reactions to Catholic stimuli.

In summation, by examining each dimension, three out of eight hypotheses (H1b, H2b, and H3b-2) were supported at the 0.05 significance level. Table 11 sums up the stimuli testing, hypotheses, Alpha wave comparisons between the two groups, expected direction of Alpha waves, and the results of hypothesis testing.

Table 11. Results of Hypotheses Testing

Stimuli Testing	Hypotheses	Alpha Wave Comparison Between Groups	Expected Alpha Wave	Hypothesis Testing
Apple	H1a	G1 vs. G2	G1 > G2	Not Supported
Apple	H1b	G3 vs. G4	G3 > G4	**Supported**
Catholic	H2a	G1 vs. G3	G1 > G3	Not Supported
Catholic	H2b	G2 vs. G4	G2 > G4	**Supported**
Apple	H3a-1	G1 vs. G4	G1 > G4	Not Supported
Catholic	H3a-2	G1 vs. G4	G1 > G4	Not Supported
Apple	H3b-1	G2 vs. G3	G2 < G3	Not Supported (G2 > G3)
Catholic	H3b-2	G2 vs. G3	G2 > G3	**Supported** (G2 > G3)

G1 = HAHC, G2 = LAHC, G3= HALC, G4 = LALC (HAHC: High Apple High Catholic)

Other tests were conducted to examine whether Apple (Catholic) devotees activated higher Alpha waves than indifferents when viewing Apple (Catholic) stimuli regardless of their devotion to Apple (Catholicism).

				Apple	
Catholicism	High (Devotees)	30 (G1 + G2)		High (Devotees)	Low (Indifferents)
	Low (Indifferents)	30 (G3 + G4)		30 (G1 + G3)	30 (G2 + G4)

Table 12. Combined Catholic (Apple) Devotees (High) and Indifferents (Low)

Table 12 demonstrates how the groups were combined for one-way ANOVA testing. Group 1 (G1) and Group 2 (G2) denote Catholic devotees with high devotion to Catholicism; Group 3 (G3) and Group 4 (G4) denote Catholic indifferents who have low devotion to Catholicism. With the same logic, Apple devotees and indifferents were combined. Group 1 (G1) and Group 3 (G3) denote Catholic devotees who have high devotion to Catholicism; Group 2 (G2) and Group 4 (G4) denote Catholic indifferents who have low devotion to Catholicism.

One-way ANOVA was conducted with the combined Catholic (Apple) devotees and indifferents shown in Table 13. Only in the Material Dimension did both devotees and

indifferents of Catholicism and Apple have statistically significant differences in the percentage changes of Alpha waves (Table 13). Interestingly, the percentage change of Alpha waves between Catholic devotees and indifferents were in the opposite direction to those of Apple (Figure 21). The left graph in Figure 21 illustrates the Alpha wave percentage change between Catholic devotees and indifferents. The blue bar represents their Alpha baseline. The orange bar represents Alpha wave changes. When participants started to view the visual stimuli, their Alpha waves, usually associated with transcendence, normally reduced because they were being exposure to external stimuli. Catholic indifferents' Alpha waves reduced twice as much as devotees. Catholic devotees' Alpha waves appear to be triggered higher than indifferents.

Table 13. Statistically Significant Differences in Material Dimension

Dimensions	Catholic Devotees and Indifferents	Apple Devotees and Indifferents
1. Ritual		
2. Emotional		
3. Narrative		
4. Doctrinal		
5. Legal		
6. Institutional		
7. Material	✓	✓

In contrast, Apple devotees' Alpha waves decreased much more than the indifferents' in the Material Dimension. Perhaps the requirement to process information caused the reduction of Alpha waves. It is important to note that even though the other six dimensions did not have statistically significant differences between devotees and indifferents in their Alpha waves, the decrease of the Alpha waves of Catholic devotees and indifferents were similar to those of Apple devotees in other dimensions.

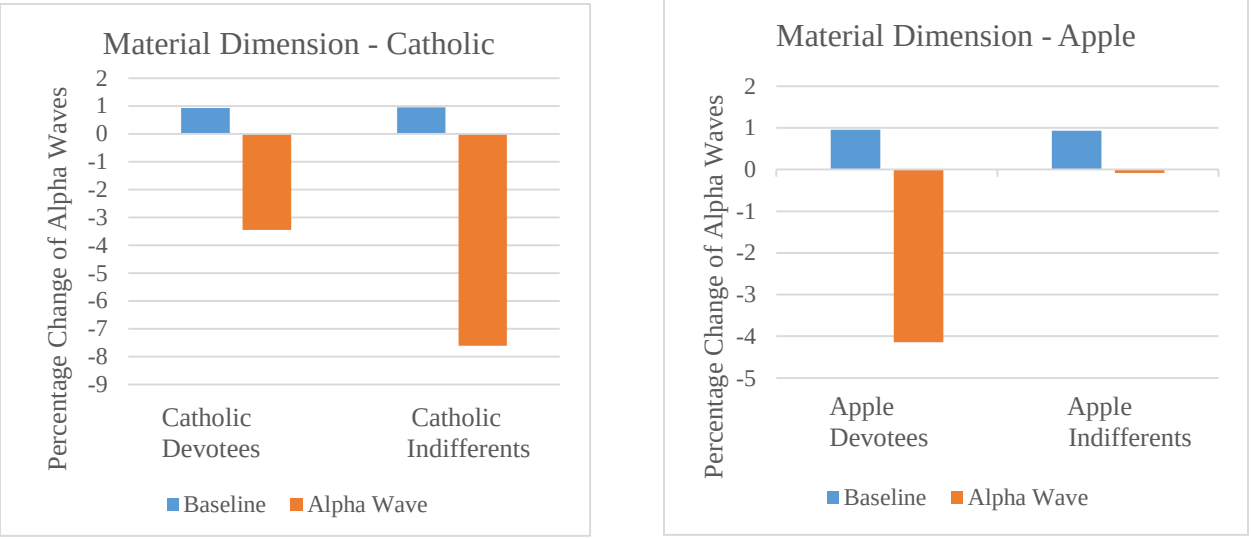


Figure 21. Catholic (Apple) Material Dimension in Alpha Wave Percentage Change between Catholic (Apple) Devotees and Indifferents

The analogy of Apple and religion depends on whether Apple influences its devotees in a similar way that Catholicism impacts its devotees. In order to examine this effect, this research also examined Apple devotees (the combination of G1 and G3) and Catholic devotees (the combination of G1 and G2) reactions toward Apple and Catholic visual stimuli as a comparison. One-way ANOVA was conducted to test the level of devotion in the EEG Alpha wave measurements. Table 14 presents the results of the two groups of devotees while they viewed Apple (left column) and Catholic (right column) visual stimuli in seven dimensions. In the Ritual Dimension, Catholic devotees' Alpha waves (M = -4.63, SD = 6.20) were much higher than Apple devotees' (M = -9.1131. SD = 8.4456). There was a statistically significant difference, F (1, 58) = 5.494, p = .023 at the 0.05 significance level, between Apple and Catholic devotees when they viewed Apple visual stimuli. On the contrary, when the two groups of devotees viewed Catholic visual stimuli, Catholic devotees' Alpha waves (M = -3.24, SD = 8.39) were higher than Apple devotees' (M = -7.67, SD = 7.50) in the Narrative Dimension, F (1, 58) = 4.639, p = .035. The difference is statistically significant at the 0.05 significance level. In the

Legal Dimension, Alpha waves of Catholic devotees (M = -3.38, SD = 6.76) were higher than Apple devotees (M = -7.45; SD = 9.15), F (1, 58) = 3.838, p = .055), and the difference is marginally significant.

Table 14. Statistically Significant Differences between Apple and Catholic Devotees

Dimensions	Apple Stimuli	Catholic Stimuli
	Apple Devotees/Catholic Devotees	Apple Devotees/Catholic Devotees
1. Ritual	✓	
2. Emotional		
3. Narrative		✓
4. Doctrinal		
5. Legal		✓
6. Institutional		
7. Material		

Again, this comparison demonstrated that Apple devotees did not trigger the feeling of transcendence while viewing Apple visual stimuli. Instead, Apple devotees processed the Ritual Dimension visual images much more than their counterparts.

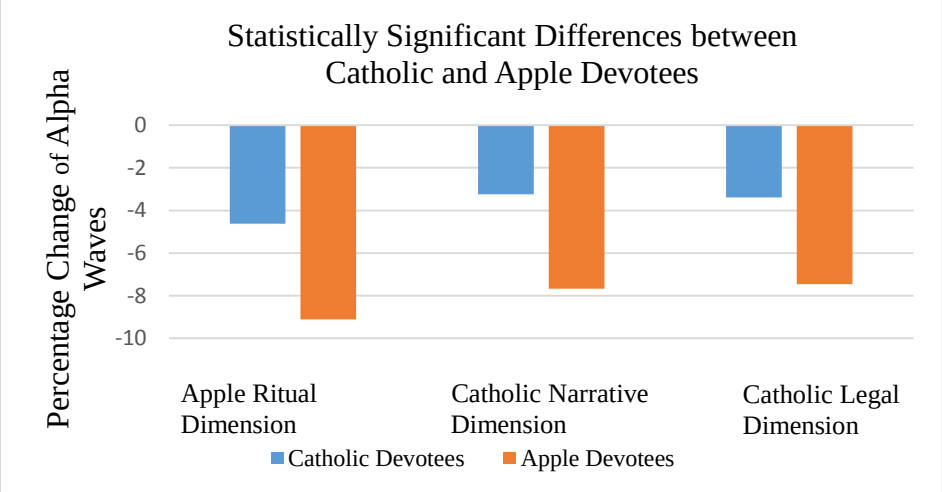


Figure 22. Statistically Significant Differences between Catholic and Apple Devotees in Alpha Wave Percentage Change

In contrast, Catholic devotees had higher Alpha waves, as a representation of spiritual feeling, than Apple devotees when they viewed Catholic visual stimuli in the Narrative and Legal Dimensions.

Figure 22 and Table 14 convey the same information, except Figure 22 demonstrates the degree of reduction in Alpha waves between Catholic and Apple devotees. The blue bar represents Catholic devotees' Alpha wave changes, whereas the orange bar indicates Catholic devotees' Alpha wave changes, both compared to their recorded baseline. The calculations are identical as the steps presented in Appendix G, except the comparison in Figure 22 and Table 14 is between Catholic and Apple devotees. The comparison between devotees demonstrates that Catholic devotees triggered higher Alpha waves than their Apple counterparts when viewing Catholic visual stimuli. Apple devotees did not trigger high Alpha waves compared with Catholic counterparts when they both viewed Apple visual stimuli. This pattern remained in all the dimensions, even though there is no statistically significant differences between devotees. The results show that Apple does not trigger in its devotees the spiritual feelings towards the visual stimuli.

CHAPTER VI

FINDINGS, DISCUSSIONS, CONTRIBUTIONS, LIMITATIONS, AND FUTURE RESEARCH

The purpose of this research was to determine whether Apple, Inc. is similar to a religion in that it triggers in its devotees reactions similar to those of religious devotees. Previous studies have explored the Apple community's cult-like phenomenon in regards to Newton fandom (Belk and Tumbat 2005); while others have suggested that technology can be viewed as an implicit religion due to its seemingly magical ability to produce operations that are non-comprehensible to conventional users (Stahl 1999). The description of Apple's cult-like following is based on the observation of Apple online community activities and Apple devotees' behavior. When a brand can be described as a religion, it is reasonable to explore the psychophysical effects that Apple has on its devotees.

Religious connection is a private, personal, and emotional feeling. Previous research has focused on the impact of religion on consumer behavior (Mokhlis 2009). Religious belief is very difficult to measure (Wilkes et al. 1986), particularly the spiritual experience that is rather personal and subjective, sometimes beyond description. Despite the difficulty in reaching a generalized measurement, religion could help to serve as the foundation of one's beliefs, attitudes, and behavior (Fishbein and Ajzen 1975). If people are not satisfied with their religion for these purposes, they will find alternatives to fulfill portions of these needs such as an

emotional bond, and more importantly, to make meaning of life through this alternative (Atkin 2004). Whether Apple devotees have found an alternative to religion is a question this research intended to explore. This research recruited Apple (Catholic) devotees and indifferents to first evaluate their levels of devotion through a self-reporting survey. The purpose of using self-reporting as the first part of the study was to identify the levels of devotion of Apple (Catholic) devotees and indifferents. Each survey participant was categorized into one of four groups as to high vs. low levels of devotion in Apple and Catholicism. With participants' willingness to continue to the next phase, an EEG study, each of them viewed Apple and Catholic visual stimuli while their Alpha waves were recorded. The researcher analyzed Alpha waves, which are commonly used for detecting the impact of religion on one's state of mind (Foster 1990).

The following sections describe the procedures followed in this research to explore the phenomenon of cult-like followings. The findings of the two studies conducted are then discussed. Theoretical contributions that broaden the understanding of existing theories discussed in Chapter I will then be considered. Practical contributions will be explained as they extend the business application for companies that intend to create a zealous following, which includes devotees to their products. Limitations and further research needs end this chapter.

Findings and Discussions

With a theoretical framework, this research provided the foundation to examine an individual's perception of what religion is and whether Apple can be considered similar to a religion.

In Study 1, factors did not extract as expected in the seven dimensions. After convergent and discriminant validity, there were three constructs generated from the Catholic scale and four constructs generated from the Apple scale. These results were not in line with the seven

dimensions of religion that were used for the theoretical framework as expected. First, I will discuss the outcome of the Catholic scale, followed by the Apple scale.

In the Catholic scale, the first construct consisted of items from Narrative, Emotional, Legal, Doctrinal, and Ritual Dimensions. The second construct was composed of items from Ritual and Institutional Dimensions. The third construct included items from the Material Dimension. The possible explanation for these results is that Catholic devotees and indifferents view their devotion to Catholicism in a combination of more than one dimension, rather than a clear separation of each dimension. For example, Smart (1989) indicates that the Ritual and Emotion Dimensions are related. In addition, ritual occurrence to Catholic devotees may be related to the Institutional Dimension, such as going to church on a regular basis.

The Apple scale was developed based on the Catholic scale because there is no existing "Apple scale." It is reasonable to expect that the Apple scale would generate similar constructs in the statement, "Apple is a religion," if Apple devotees evaluated Apple and Catholicism in a similar way. However, the scale development with reliability and validity testing presented different outcomes. For instance, the first Apple construct included items from the Institutional, Emotional, and Ritual Dimensions; the second construct consisted of items from the Material, Doctrinal, Ritual, and Emotional Dimensions; the third construct was composed of items merely from the Legal Dimension; and the fourth construct included items from the Narrative Dimension only.

Interestingly, when all the items (32 = Catholic scale; 31 = Apple scale) were run in EFA, all of the Apple items were negatively correlated with the Catholic items. This correlation remains the same in CFA in that all three Catholic constructs were negatively correlated with the four Apple constructs. This may indicate that Catholic devotees perceive devotion to Apple

negatively and vice versa. That is, Catholic indifferents are more likely to have a positive attitude towards Apple.

Normally, the Alpha wave decreases when one is exposed to external stimuli. However, the amplitude recovers quickly afterward. This explains the negative value when the Alpha baseline is subtracted from the Alpha waves of each dimension. However, a religious individual was expected to reduce much less than a religious indifferent. Catholic visual stimuli in Study 2 had corresponding results in the dimensions. However, Apple visual stimuli did not result in the same expectation, but a reverse one.

In Study 2, Catholic devotees had statistically significant higher Alpha waves when they viewed Catholic stimuli compared to Catholic indifferents, especially in the Material Dimensions when their devotion to Apple was low (H2b). In addition, Catholic devotees triggered higher Alpha waves compared to Catholic indifferents when they viewed Catholic stimuli in the Narrative, Legal, and the averaged seven dimensions when their devotion to Apple was low (H3b-2).

However, Apple devotees did not have a statistically significant increase of Alpha waves when they viewed Apple stimuli compared to Apple indifferents. Apple devotees did not trigger as high an Alpha wave when they viewed Apple stimuli as Catholic devotees did when they viewed Catholic stimuli. There was a statistically significant difference in the Material Dimension (H1b) between Apple devotees and indifferents. Yet, the increased amplitude of Alpha waves was not as expected: Apple indifferents' Alpha waves were higher than devotees' when they viewed Apple stimuli. The same opposite results also occurred in the Ritual, Emotional, and the averaged seven dimensions (H3b-1) in that Apple indifferents triggered higher Alpha waves than devotees when they viewed the Apple stimuli. That is, Apple devotees'

Alpha waves reduced much less than Apple indifferents. This suggests that the Apple devotees did not have the subconscious transcendent feelings that the Catholic devotees did. The reduction of Alpha waves may suggest that Apple devotees processed the Apple visual stimuli more than indifferents. The Apple devotees' continuous processing of Apple stimuli could be the cause of the drastic decrease in Alpha waves. Apple indifferents' Alpha waves reduced slightly compared to their baseline. This result is in line with the findings in Custódio (2010), which suggested people who dislike the brand process less stimuli due to loss of interest. The outcome of Alpha waves in Catholic (Apple) devotees and indifferents demonstrate that it is feasible to examine the reactions toward a devotees' beloved brand subconsciously and objectively.

Antik (2004) explains reasons for the formation of popular cult brand communities. People have the need to belong. When religion or other social means cannot satisfy this need, they look for alternatives. Perhaps Apple is parallel to the way religion reaches its believers and Apple devotees find this alternative to be close enough to fulfill the need to belong, but this study indicates that it does not necessarily have the impact on their minds in the same way a religion does.

Theoretical Implications

This research used the Smart's seven dimensions of religion (1989)—which provides a view of comparative religions by observing the traits of the world's religions—as its theoretical foundation and as a basis for developing scales for Apple and Catholic devotees. The significance of this research lies in four perspectives, all related to theoretical contributions.

In the first perspective, religion is a multidimensional concept that is measured from the perspective of theology (Allport 1954; Glock 1954; King 1967; King and Hunt 1975). In psychology, the research of religion is considered a multilevel, interdisciplinary paradigm

(Paloutzian and Park 2013). This research incorporated the institutional aspects proposed by the Smart's seven dimensions of religion to examine the reasons for Apple to develop into such a cult-like phenomenon in comparison to the Catholic context. The results showed that devotees and indifferents practice their religion in different ways when dealing with Apple.

In the second perspective, methodologically speaking, this research used self-reporting to provide a subjective evaluation in Catholic and Apple devotees' levels of devotion. The extent of devotion can be distinguished with ritual devotion, emotional devotion, etc. "It has been well established that patterns of brain activities are closely correlated with behavior and cognition" (Ohme et al. 2011). It is therefore appropriate to understand the cult-like following parallel to religion by using neuroscientific techniques—especially because the topic of religion can easily lead to biased answers with self-reporting. Therefore, the EEG experiment provided an objective measurement to examine whether Apple has the same impact as religion to its devotees.

Theoretically speaking, the seven dimensions of religion provide a framework to evaluate devotions in the developed seven classifications of devotion; these were measured with the same dimension in the EEG experiment. Even though there were not seven factors generated in the Catholic and Apple scales separately as expected, the outcomes remain meaningful. These reasons include: 1) self-reporting helped to identify how individuals classify their devotion to Catholicism and Apple; 2) in the EEG experiment, some dimensions triggered more Alpha waves than others.

The results of Study 1 demonstrate that devotees and indifferents evaluate their level of devotion toward Apple and Catholicism from an individual's perspectives based on their self-reporting. Each individual executes their devotion to Apple and Catholicism in different ways, through combinations of items from several Dimensions. The results represent a difference

between an individual's experiences with Apple and Catholicism with what actually constitutes Apple and Catholicism. The data from the self-reported psychometric questionnaire is impeded by subjective measurements (Kuan et al. 2014). The implementation of EEG in recording Alpha waves demonstrates unconscious reactions towards seven dimensions of religion presented by visual stimuli. The EEG recording provides another measurement that the self-reporting survey was unable to accomplish (Wang and Minor 2008). Hence, the seven dimensions of religion provide a theoretical framework for visual stimuli in Study 2 consistently throughout this research. The subjective self-reported data in Study 1 and neurological responses recorded by the EEG device in Study 2 enhances the understanding of subconscious feelings that are embedded in the level of devotion beyond one's recognition in the impact on one's awareness.

This research concludes that inconsistent statistical results from the self-reporting survey and neuroscientific studies suggest that self-reporting cannot predict neuroscientific responses. Rather than exploring how a religious person behaves in a certain way, this research sought psychophysiological measures to examine whether Apple is a religion as a number of marketing, sociology, and neuromarketing studies has suggested. The survey and EEG measurements contribute to efforts to capture the characteristics of Apple and Catholic devotees located in the Texas border region of the United States.

Third, this research developed Catholic and Apple scales. The Catholic scale extracted three factors and the Apple scale generated four factors in CFA. The total seven factors were relabeled. The largest factor in the Catholic scale had 17 items. These 17 items are in line with the construct Religious Commitment Inventory, RCI-10, in measuring religiosity (Worthington et al. 2003). CFA analysis in the Catholic scale did not have clearly identified factors falling into the seven dimensions. This may be due to the fact that some participants considered ritual and

experiential as one dimension, whereas others considered ritual and material as a separate dimensions, which were defined by intrinsic-extrinsic religiosity (Allport and Ross 1967). Even though the factors did not load as expected, the divided definition of each dimension includes the major shared components of what constitutes a religion.

In the theological literature, there are thirteen common domains to measure religiosity: religious beliefs, spirituality, meaning and values, private practices, attachment, motivating forces, and more (Paloutzian and Park 2013, p. 65-67), used for their reliability and validity in some studies. One can distinguish differences in the wording of items in the theological literature when compared to the marketing literature. Smart (1978; 1989; 1996; 1998) observed the world's religions, then sought to identify the seven dimensions over twenty years. Those seven dimensions serve as the basis for the theoretical foundation of this study from a rational, observant point of view. However, devotees may consider all religious and spiritual experiences while practicing rituals and producing emotional attachments to their institutions (churches) and the rosary in their daily rituals. Furthermore, from the operational perspective, the construct of "religiosity" allows more statistical testing in terms of reliability and validity (Vries-Schot et al. 2012) for a specific religion. A unidimensional definition of religion narrows the complexity and limits the ability to capture dynamic phenomena (Paloutzian and Park 2013).

Fourth, as Achrol and Kotler (2012) addressed in their seminal article, "to be a skilled consumer researcher may mean one has to be half a neurophysiologist with expertise…marketing scholars will need educational backgrounds in marketing on top of education in special fields of science such as neurophysiology" (p. 51). If this research had used only the self-reporting survey, the conclusion probably would have been "Apple has created a cult-like following" because four factors were extracted from the operationalization of the Apple scale. However,

with the EEG Alpha wave measurement, this research can conclude that while Apple may tap into some characteristics of Catholicism, Apple does not garner the same transcendent reaction as Catholicism on its devotees. Qualitative observations of cult-like following can help explain how and why this phenomenon occurs. To claim Apple *is* a religion is a strong statement that this research did not support with psychophysical measurements.

Practical Implications

Apple devotees strongly revealed their feelings toward Apple while taking the survey. Emotional and Institutional Dimensions were extracted as important factors from the survey results. The Emotional Dimension is also associated with Material, Ritual, and Doctrinal Dimensions in the Apple scale. The Legal and Narrative Dimensions in the Apple scale are clearly generated.

In the EEG study, the Material, Ritual, and Emotional Dimensions of the Apple visual stimuli did show that Apple devotees processed Apple stimuli more than indifferents. Even though this research did not find transcendent feelings in the Apple devotees, the findings are worth exploring in terms of what businesses should give more focus to in their strategic development to appeal to devotees.

Interestingly, the Apple visual stimuli within the seven dimensions appealed to its devotees as shown in the averaged Alpha waves. This indicates that Apple devotees are involved and Apple taps into some of the same dimensions as religion. Specifically, Apple devotees react strongly in the Material, Ritual, and Emotional aspects. The emotional appeal fits the description that "all acute decisions reference the emotional centers of the brain…Non-rational connections form the stickiest bonds" (Atkin 2014, p. 199).

When comparing between Apple (Catholic) devotees and indifferents, both groups had statistically significant differences of Alpha waves reacting in the opposite direction in regards to the Material Dimension, which makes it an interesting aspect to discuss more deeply. Previous research emphasizes that "Apple stores all embody the magic, fantasy, and mystery found in traditional cathedrals of consumption but with the rise of technology and a more efficient means of consumption consumers are now more likely to visit treat (sic) these locations as an interactive advertisement—a playground for adults" (Marshall 2006, p. 10).t is implied in Marshall's (2006) study that the main purpose of Apple store design is not the immediate purchase. Rather, the comparable design of Apple stores as modern art museums provides a venue, a continuation of enchantment. Apple is aware that a majority of their customers shop online; yet, the Apple store connects their customers with material goods through interactive advertisements.

For centuries, "Catholics have displayed their faith materially" (McCallion and Bennett-Carpenter 2008, p. 427). In their research, McCallion and Bennett-Carpenter indicate that Catholics consider visual displays of faith as a form of evangelization. They tend to present their faith publically by visual, non-verbal, or material means. The material means include the collection of statues, jewelry, and elaborate altars displayed in churches or for domestic collection. The material means are ways for Catholic devotees to express their faith and connect with feeling of transcendence. Catholics are used to the material means in various formats as a symbol to express their faith. Similarly, consumers use material goods to identify themselves as an expression of existence. Therefore, based on this research, the ideal target market for computer manufacturers and marketers would be Catholics who are less religious.

Customers also look for symbolic tools in a brand logo (Wang et al. 2012). Logos functionalize daily tasks in which technology represents power that enables building ritualistic experiences with users.

A business hoping to create a cult-like following should create experiential relationships with customers in these three dimensions, specifically buildings, symbols, and extraordinary experiences. This research provides a different perspective for examining Apple's cult-like creation to influence its devotees at the neuroscientific level.

Limitations

The limitations of this research are threefold. The first limitation lies in the ability to use only a few sites, namely Fz-Cz-Pz, to measure the participant's Alpha waves. Alpha waves are most prominent in an eyes-closed condition (Foster 1990). When participants view visual stimuli, Alpha waves are not produced as strongly, but can still trigger a significant amount of Alpha waves.

EEG sensors can measure up to 256 channels (Pflieger and Sands 1996), as shown in Figure 23. The number of sensor sites in this research was restricted due to the availability of the equipment and budget needed to increase the number of channels. A larger number of EEG channels would not only enable the researcher to generate and locate Alpha waves from multiple locations, but also identify Alpha waves from the right and left hemispheres (Wang and Minor 2008). Even with this limitation, the Alpha waves between Apple (Catholic) devotees and indifferents still reveal statistically significant differences in comparisons between the two groups.

Figure 23. Electrical Geodesics Incorporated 256 Channels of EEG (Electrical Geodesics, Inc., 2015)

Secondly, the EEG studies permitted only small samples due to the time and costs of recruiting participants. The nature of this technical operation applies to this research in that each EEG experiment took fifty minutes to one hour to complete, including an explanation to each participant, attempts to make them feel comfortable in their surroundings, and overall following the procedure of EEG experimentation mentioned in Chapter IV (i.e. cleaning EEG sensors and linked-ear electrodes after the experiment ended, etc.). This research scheduled a maximum of six participants per day, sometimes including no-shows for rescheduling. Rescheduling and keeping track of each potential EEG participant required persistent reminders for the experiments to proceed as planned.

The four groups of participants in the one-way ANOVA do not have equivalent numbers of participants for each group, although the numbers are fairly close. This is due to the fact that participants had to demonstrate their willingness to come for the EEG experiment. A large number of survey participants decided not to participate in the EEG experiment, and that restricted the distribution of EEG participants into four groups. Even in survey participants agreed to participate in the EEG experiment, three out of 63 EEG participants were excluded due to excessive noise artifacts and an inadequate amount of data to analyze. That led to the uneven

number of EEG participants for the final analysis. Re-collecting data for the uneven numbers of two cells was not feasible considering the researcher's limited access to the EEG equipment. Since EEG participants could not be assigned randomly to each group, the assignment was based on the scores of their self-reporting survey and there was no need to have equivalent numbers of subjects in each cell.

The third limitation lies in the fact that the EEG participants were only from the South (Texas) rather than other regions in the United States. Due to the nature of the EEG study, participants were required to be present in person to view visual stimuli while EEG sensors were attached to their scalps and earlobes. Therefore, the range of the EEG participants could not be broadened. Certain initial survey participants could not be part of the EEG experiment due to their location, and they might have contributed greatly to the EEG study. In addition, each EEG participant came to the same room (BUSA 117 at UTPA) to participate in the experiment to maintain consistency of the environment. Some may have felt uncomfortable because it was an unfamiliar environment. The majority of the participants did not know the researcher, and they might have felt uneasy to participate in the experiment for a full hour.

Future Research

Religion helps one to find identity, discover the meaning of life, and find purpose in one's existence. Religion also functions to bring believers comfort, reduce anxiety, and to contribute to a stable mental state. Whether brands or companies can achieve these same effects needs to be further studied.

Employing other cult-like brands such as Coke, Volkswagen Beetle, Harley-Davidson, or even Oprah Winfrey (Ragas and Bueno 2011) would be of interest to see if their devotees produce high Alpha waves when they are exposed to their beloved brands. In addition,

compatible comparisons of Samsung versus Apple would be interesting to evaluate. Even though the visual stimuli of Apple included one image of Samsung, which was not the main focus of this research, there are a great number of Samsung devotees who emphasize the value of flexibility in Samsung products, and they may also produce Alpha waves in different dimensions of the seven dimensions of religion through visual stimuli.

Brands may, similar to religion, reduce anxiety because of a certain value perceived by users. Future research can extend the scope from the findings of this research. Ritzer (1999) notes that people go to shopping malls to practice their "consumer religion," so if certain brands can increase feelings of security, safety, and power, are they looking for a brand that can bring them the same feeling as religion does? Is it likely that consumers merely explore the experience of the "re-enchantments" in daily life (Firat and Venkatesh 1995) through brands that create a cult-like following?

Future studies can extend to other parts of the United States in capturing the characteristics of the Apple and Catholic devotees to generalize their common shared traits. In addition, this research can broaden to Apple and Catholic devotees in different countries for future research. Evangelical non-Catholics are also of interest to extend the understanding of other religions. Buddhism advocates the idea of "selflessness"—in future research I expect to pursue questions such as, "Would Buddhists generate different dimensions of religion when compared to Catholics?" Though there is much potential further study in this area, the current study provides academic scholars and marketing professionals a solid starting point for future research.

REFERENCES

Aamodt, Sandra A. and Sam Wang (2008), *Welcome to Your Brain: Why You Lose Your Car Keys but Never Forget How to Drive and Other Puzzles of Everyday Life*: Bloomsbury Publishing.

Acosta, Paul M. and R. A. J. Devasagayam (2010), "Brand Cult: Extending the Notion of Brand Communities " *Marketing Management Journal*, 20, 165-76.

Achrol, Ravi. S. and Philip Kotler (2012). Frontiers of the Marketing Paradigm in the Third Millennium. *Journal of the Academy of Marketing Science*, 40(1), 35-52.

Adhami, Melody (2013), "Using Neuromarketing To Discover How We Really Feel About APPS," *International Journal of Mobile Marketing*, 8 (1), 95-103.

Allen, Frederick E. (2011), "The Religion of Apple," in *Forbes*. (accessed July 30, 2014), [available at http://www.forbes.com/sites/frederickallen/2011/03/28/the-religion-of-apple/].

Allport, Gordon W. (1954), "Religion and Prejudice," in *The Nature of Prejudice*: Cambridge: Addison-Wesley.

Allport, Gordon W. and J. Michael Ross (1967), "Personal Religious Orientation and Prejudice," *Journal of Personality and Social Psychology*, 5 (4), 432-43.

Appel, Valentine, Sidney Weinstein, and Curt Weinstein (1979), "Brain Activity and Recall of TV Advertising," *Journal of Advertising Research*, 19 (4), 7.

Astoffi, Laura, F. De Vico Fallani, F. Cincotti, D. Mattia, L. Bianchi, M. G. Marciani, S. Salman, A. Colosimo, A. Tocci, R. Soranzo, and F. Babiloni (2008), "Neural Basis for Brain Responses to TV Commercials: A High-Resolution EEG Study," *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 16 (6), 522-31.

Argyle, Michael and Benjamin Beit-Hallahmi (1975), *The Social Psychology of Religion*. London: Routledge.

Arora, Harsh (2009), "A Conceptual Study of Brand Communities," *ICFAI Journal of Brand Management*, 6 (2), 7-21.

Arroyo, Santiago, Ronald P. Lesser, Barry Gordon, Sumio Uematsu, Darryl Jackson, Robert Webber (1993), "Functional Significance of the Mu Rhythm of Human Cortex: An

Electrophysiologic Study with Subdural Electrodes," *Electroencephalography and Clinical Neurophysiology*, 87 (3), 76–87.

Arruda-Filho, Emílio J. M., Julianne A. Cabusas, and Nikhilesh Dholakia (2010), "Social Behavior and Brand Devotion among iPhone Innovators," *International Journal of Information Management*, 30, 475-80.

Aurup, Golam Mohammad and Ali Akgunduz (2012), "Pair-Wise Preference Comparisons Using Alpha-Peak Frequencies," *Journal of Integrated Design & Process Science*, 16 (4), 3-18.

Babiloni (2008), "Structure Of The Cortical Networks During Successful Memory Encoding In TV Commercials," *Clinical Neurophysiology*, 119 (10), 2231-37.

Babiloni, Fabio, Febo Cincotti, Donatella Mattia, Marco Mattiocco, Simona Bufalari, Fabrizio De Vico Fallani, Andrea Tocci, Luigi Bianchi, Maria Grazia Marciani, Vittorio Meroni, and Laura Astolfi (2006), "Neural Basis for the Brain Responses to the Marketing Messages: An High Resolution EEG Study," Conference Proceedings: Annual International Conference of the IEEE Engineering In Medicine And Biology Society. *IEEE Engineering in Medicine and Biology Society*. Annual Conference, 1, 3676-79.

Bader, Christopher D., Paul Forese, Byron Johnson, F. Carson Mencken, and Rodney Stark (2005), "Baylor Religion Survey, Wave I" The Baylor Religion Survey. Waco, TX: Baylor Institute for Studies of Religion. (accessed July 30, 2015), [available at http://www.thearda.com/Archive/Files/Descriptions/BRS2005.asp].

Bagozzi, Richard P., Yi, Youjae. and Lynn W. Phillips (1991), "Assessing construct validity in organizational research, " *Administrative Science Quarterly*, 36 (3), 421–458.

Bagozzi, Richard P. and Youjae Yi (2012), "Specification, Evaluation, and Interpretation of Structural Equation Models," *Journal of the Academy of Marketing Science*, 40 (1), 8-34.

Bailey, Jessica M. and James Sood (1993), "The Effects Of Religious Affiliation On Consumer Behavior: A Preliminary Investigation," *Journal of Managerial Issues*, 5 (3), 328-52.

Balconi, Michela, Beniamino Stumpo, and Federica Leanza (2014), "Advertising, Brand and Neuromarketing or How Consumer Brain Works," *Neuropsychological Trends*, 16, 15-21.

Banquet, J. P. (1973), "Spectral Analysis of the EEG in Meditation," *Electroencephalography and Clinical Neurophysiology*, 35 (2), 143-51.

Bartkowski, John P. and W. Scott Swearingen (1997), "God Meets Gaia in Austin, Texas: A Case Study of Environmentalism as Implict Religion," *Review of Religious Research*, 38, 308.

Bartlett, Maurice S. (1954), "A Note on the Mulitplying Factors for Various Chi Square Approximations," *Journal of the Royal Statistical Society*, 16 (B), 296-98.

Barone, Michael J., Andrew T. Norman, and Anthony D. Miyazaki (2007), "Consumer Response to Retailer Use of Cause-Related Marketing: Is More Fit Better?," *Journal of Retailing*, 83 (4), 437-45.

Batson, C. Daniel, Patricia Schoenrade, and W. Larry Ventis (1993), *Religion and the Individual: A Social-Psychological Perspective.* New York: Oxford University Press.

Bearden, William O., David M. Hardesty, and Randall L. Rose (2001), "Consumer Self-Confidence: Refinements in Conceptualization and Measurement," *Journal of Consumer Research*, 28 (1), 121-34.

Beauregard, Mario and Vincent Paquette (2008), "EEG Activity in Carmelite Nuns during a Mystical Experience," *Neuroscience Letters*, 444 (1), 1-4.

Belk, Russell W. (1988), "Possessions and the Extended Self," *Journal of Consumer Research*, 15 (2), 139-68.

Belk, Russell W. and Gülnur Tumbat (2005), "The Cult of Macintosh," *Consumption, Markets and Culture*, 8 (3), 205-17.

Bellah, Robert N. (1991), *Beyond Belief: Essays on Religion in a Post-Traditionalist World*: University of California Press.

Benner, David G. (1989), "Toward a Psychology of Spirituality: Implications for Personality and Psychotherapy," *Journal of Psychology and Christianity*, 5, 19-30.

Bickle, Marianne (2010), *Fashion Marketing: Theory, Principles and Practice*: Bloomsbury Academic.

Bogart, Leo and B. Stuart Tolley (1988), "The Search For Information In Newspaper Advertising," *Journal of Advertising Research*, 28 (2), 9-19.

Boome, Adam, Alex Riley, James Vale, and Lisa Dunn (2011), "Secrets of the Superbrands." New York: Films for the Humanities and Sciences.

Bourdaud, Nicolas, Ricardo Chavarriaga, Ferran Galán, and José del R. Millán (2008), "Characterizing the EEG Correlates of Exploratory Behavior," *IEEE Transactions on Neural Systems & Rehabilitation Engineering*, 16 (6), 549-56.

Bourdieu, Pierre (1991), *Language and Symbolic Power*: Harvard University Press.

Cacioppo, John T. and Richard E. Petty (1982), "The Relationship between Differential Hemispheric Alpha Abundance and the Affective Polarization of Thoughts about an Attitude Issue," *Advances in Consumer Research*, 9 (1), 156-60.

Cell Biology Promotion (2014), (accessed July 30, 2015), [available at http://www.cellbiol.net/ste/alpobesity3.php].

Chalfant, H. Paul (1992), "Stepping to Redemption: Twelve Step Groups as Implict Religion," *Free Inquiry in Creative Sociology*, 20 (2), 115-20.

Cheung, Mei-chun, Derry Law, and Joanne Yip (2014), "Evaluating Aesthetic Experience through Personal-Appearance Styles: A Behavioral and Electrophysiological Study," *PLoS ONE*, 9 (12), 1-22.

Clark, Walter Houston (1958), "How do Social Scientists Define Religion?," *The Journal of Social Psychology*, 47 (1), 143-47.

Cockrill, Antje (2012), "Does an iPod Make You Happy? An Exploration of the Effects of iPod Ownership on Life Satisfaction," *Journal of Consumer Behaviour*, 11 (5), 406-14.

Cook, Ian A., Clay Warren, Sarah K. Pajot, David Schairer, and Andrew F. Leuchter (2011), "Regional Brain Activation With Advertising Images," *Journal of Neuroscience, Psychology, & Economics*, 4 (3), 147-60.

Cult. (1993), "Bloomsbury Guide to Human Thought," in Credo Reference. London: Bloomsbury.

Delener, Nejdet (1990), "The Effects of Religious Factors on Perceived Risk in Durable Goods Purchase Decisions," *Journal of Consumer Marketing*, 7 (3), 27-38.

---- (1994), "Religious Contrasts in Consumer Decision Behaviour Patterns: Their Dimensions and Marketing Implications," *European Journal of Marketing*, 28 (5), 36-53.

Devotee. (2013), "American Heritage Roget's Thesaurus," in Credo Reference. Boston, MA: Houghton Mifflin.

Dmochowski, Jacek P., Matthew A. Bezdek, Brian P. Abelson, John S. Johnson, Eric H. Schumacher, and Lucas C. Parra (2014), "Audience Preferences Are Predicted By Temporal Reliability Of Neural Processing," *Nature Communications*, 5, 4567-67.

Dollahite, David C. (1998), "Fathering, Faith, and Spirituality," *Journal of Men's Studies*, 7 (1), 3-15.

Donahue, Michael J. (1985), "Intrinsic and Extrinsic Religiousness: The Empirical Research," *Journal for the Scientific Study of Religion*, 24 (4), 418-23.

Doufesh, Hazem, Tarig Faisal, Kheng-Seang Lim, and Fatimah Ibrahim (2012), "EEG Spectral Analysis on Muslim Prayers," *Applied Psychophysiology and Biofeedback*, 37 (1), 11-18.

Doyle, Derek (1992), "Have We Looked Beyond the Physical and Psychosocial?," *Journal of Pain and Symptom Management*, 7 (5), 302-11.

Electrical Geodesics, Inc (2015), (accessed July 30, 2015), [available at http://www.egi.com/index.php].
Fabrigar, Leandre R., Duane T. Wegener, Robert C. MacCallum, and Erin J. Strahan (1999), "Evaluating the Use of Exploratory Factor Analysis in Psychological Research," *Psychological Methods*, 4 (3), 272-99.

Faulkner, Joseph F. and Gordon F. De Jong (1966), "Religiosity In 5-D: An Empirical Analysis," *Social Forces*, 45 (2), 246-54.

Felix, Reto (2012), "Brand Communities for Mainstream Brands: The Example of the Yamaha R1 Brand Community," *Journal of Consumer Marketing*, 29 (3), 225-32.

Firat, A. Fuat and Alladi Venkatesh (1995), "Liberatory Postmodernism and the Reenchantment of Consumption," *Journal of Consumer Research*, 22 (3), 239-67.

Firmin, Michael W., Ruth L. Firmin, Whitney Muhlenkamp Wood, and Jordan C. Wood (2010), "Social Influences Related to College Students' Use of Macintosh Computers on an All-PC Campus," *Computers and Education*, 55 (4), 1542-51.

Fishbein, Martin and Icek Ajzen (1975), *Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research*: Addison-Wesley Pub. Co.

Fitzsimons, Gráinne M., Tanya L. Chartrand, and Gavan J. Fitzsimons (2008), "Automatic Effects of Brand Exposure on Motivated Behavior: How Apple Makes You "Think Different" *Journal of Consumer Research*, 35, 21-35.

Foster, Dale S. (1990), *EEG and Subjective Correlates of Alpha Frequency Binaural Beats Stimulation Combined with Alpha Biofeedback*: Memphis State University.

Gallo, Carmine (2012), *The Apple Experience: Secrets to Building Insanely Great Customer Loyalty*: McGraw-Hill Education.

Ganzevoort, R. Ruard (1998), "Religious Coping Reconsidered. Part One: An Integrated Approach," *Journal of Psychology and Theology*, 26/3, 260-75.

Glock, Charles Y. (1954), *Toward a Typology of Religious Orientation.* New York: Bureau of Applied Social Research, Columbia University.

Gountas, Sandra, Joseph Ciorciari, John Gountas, and Stuart Huddle (2014), "An Investigation of The EEG Correlates Associated with Viewing Alcohol and Drug Related Behaviours On Social Media," *International Journal of Psychophysiology*, 94 (2), 251-51.

Grimaldi, Loredana (2012), "Measuring The Efficacy of Advertising Communication With Neuroscience Methods: An Experiment Performed By Telecom Italia," *IEEE Pulse*, 3 (3), 48-52.

Hair, Joseph F., William C. Black, Barry J. Babin, and Rolph E. Anderson (2013), *Multivariate Data Analysis*: Pearson Education, Limited.

Hatcher, Larry (1994), *A Step-by-Step Approach to Using the SAS System for Factor Analysis and Structural Equation Modeling*: North Carolina: SAS Publishing, SAS Institute Inc. .

Hedgcock, William M., Kathleen D. Vohs, and Akshay R. Rao (2012), "Reducing Self-Control Depletion Effects through Enhanced Sensitivity to Implementation: Evidence from fMRI and Behavioral Studies," *Journal of Consumer Psychology*, 22 (4), 486-95.

Hirschman, Elizabeth C. (1983), "Religious Affiliation and Consumption Processes: An Initial Paradigm," *Research in Marketing*, 6, 131-70.

Holt, Douglas B. (2004), *How Brands Become Icons: The Principles of Cultural Branding*: Harvard Business School Press.

Hood, Ralph W., Peter C. Hill, and Bernard Spilka (2009), *Psychology of Religion, Fourth Edition: An Empirical Approach*: Guilford Publications.

Horská, Elena and Jakub Berčík (2014), "The Influence of Light on Consumer Behavior at the Food Market," *Journal of Food Products Marketing*, 20 (4), 429-40.

Hubert, Mirja and Peter Kenning (2008), "A Current Overview of Consumer Neuroscience," *Journal of Consumer Behaviour*, 7 (4/5), 272-92.

Huffmeijer, Renske, Lenneke Alink, Mattie Tops, Marian Bakermans-Kranenburg, and Marinus Ijzendoorn (2012), "Asymmetric Frontal Brain Activity and Parental Rejection Predict Altruistic Behavior: Moderation of Oxytocin Effects," *Cognitive, Affective & Behavioral Neuroscience*, 12 (2), 382-92.

Hunt, John and Dan Penwell (2008), *World Religions and Cults*: AMG Publishers.

Hyken, Shep (2009), *The Cult of the Customer: Create an Amazing Customer Experience That Turns Satisfied Customers Into Customer Evangelists*: Wiley.

Inzlicht, Michael, Ian McGregor, Jacob B. Hirsh, and Kyle Nash (2009), "Neural Markers of Religious Conviction," *Psychological Science (Wiley-Blackwell)*, 20 (3), 385-92.

Iyengar, Sheena (2010), *The Art of Choosing*: Grand Central Publishing.

James, William (1961), *The Varieties of Religious Experience New York*: Collier Books.

Jasper, Herbert H. (1958), "The Ten Twenty Electrode System of the International Federation," *Electroencephalography and Clinical Neurophysiology*, 10 (2), 371-75.

Jenkins, Eric (2008), "My iPod, My iCon: How and Why Do Images Become Icons?," *Critical Studies in Media Communication*, 25 (5), 466-89.

Jenkins, Sean, Raymond Brown, and Neil Rutterford (2009), "Comparing Thermographic, EEG, and Subjective Measures of Affective Experience during Simulated Product Interactions," *International Journal of Design*, 3 (2), 53-65.

Jones, William J., Terry L. Childers, and Yang Jiang (2012), "The Shopping Brain: Math Anxiety Modulates Brain Responses To Buying Decisions," *Biological Psychology*, 89 (1), 201-13.

Kahney, Leander (2004), *The Cult of Mac*: No Starch Press.

Kaiser, Henry F. (1974), "An Index of Factorial Simplicity," *Psychometrika*, 39 (1), 31-36.

Kasamatsu, Akira and Tomio Hirai (1969), "An Electroencephalographic Study on the Zen Meditation (Zazen)," *Psychologia: An International Journal of Psychology in the Orient*, 12 (3-4), 205-25.

Katz, James E. and Satomi Sugiyama (2006), "Mobile Phones as Fashion Statements: Evidence from Student Surveys in the US and Japan," *New Media and Society*, 8 (2), 321-37.

Kawasaki, Guy (1992), *Selling the Dream*: HarperCollins.

Khushaba, Rami N., Chelsea Wise, Sarath Kodagoda, Jordan Louviere, Barbara E. Kahn, and Claudia Townsend (2013), "Consumer Neuroscience: Assessing The Brain Response To Marketing Stimuli Using Electroencephalogram (EEG) And Eye Tracking," *Expert Systems with Applications*, 40 (9), 3803-12.

Kim, Sung-Ho, Yong-Suk Kim, and Yong-Sung Kim (2014), "Correlational Analysis of Brain Waves According to Sensual Evaluation on Commercial Makgeolli," *International Journal of Bio-Science & Bio-Technology*, 6 (1), 95-100.

King, Morton B. (1967), "Measuring the Religious Variable: Nine Proposed Dimensions," *Journal for the Scientific Study of Religion*, 6, 173-90.

King, Morton B. and Richard A. Hunt (1975), "Measuring the Religious Variable: National Replication," *Journal for the Scientific Study of Religion*, 14 (1), 13.

Kondo, C. Y., T. A. Travis, and J. R. Knott (1973), "Initial Abundance and Amplitude of Alpha as Determinants of Performance in an Enhancement Paradigm," in *Electroencephalography and Clinical Neurophysiology*, Vol. 34: Elsevier Sci Ireland Ltd. Customer Relations Manager, Bay 15, Shannon Industrial Estate Co, Clare, Ireland.

Kozinets, Robert V. (2001). Utopian Enterprise: Articulating the Meanings of Star Trek's Culture of Consumption. *Journal of Consumer Research*, 28(1), 67-88.

Krugman, Herbert E. (1971), "Brain Wave Measures of Media Involvement," *Journal of Advertising Research*, 11 (1), 3-9.

Kuan, Kevin K. Y., Yingqin Zhong, and Patrick Y. K. Chau (2014), "Informational and Normative Social Influence in Group-Buying: Evidence from Self-Reported and EEG Data," *Journal of Management Information Systems*, 30 (4), 151-78.

Lam, Pui-Yan (2001), "May the Force of the Operating System be with You: Macintosh Devotion as Implicit Religion," *Sociology of Religion*, 62 (2), 243-62.

Lashinsky, Adam (2012), *Inside Apple: How America's Most Admired—and Secretive—Company Really Works*: Grand Central Publishing.

Lawrence, Lee Matthew, Joseph Ciorciari, and Michael Kyrios (2014), "Cognitive Processes Associated With Compulsive Buying Behaviours And Related EEG Coherence," *Psychiatry Research: Neuroimaging*, 221 (1), 97-103.

Lawton, Graham and Clare Wilson (2010), Mind-Reading Marketers. *New Scientist*, 207(2772), 2.

Lee, Nick, Amanda J. Broderick, and Laura Chamberlain (2007), "What is 'Neuromarketing'? A Discussion and Agenda for Future Research," *International Journal of Psychophysiology*, 63 (2), 199-204.

Lee, Eun-Ju, Gusang Kwon, Hyun Jun Shin, Seungeun Yang, Sukhan Lee, and Minah Suh (2014), "The Spell of Green: Can Frontal EEG Activations Identify Green Consumers?," *Journal of Business Ethics*, 122 (3), 511-21.

Levy, Steven (1994), *Insanely Great: the Life and Times of Macintosh, the Computer that Changed Everything*: Viking.

Lindstrom, Martin (2008), "How Apple, Others Have Cultivated Religious Followings," in Advertising Age Vol. 79: Crain Communications Inc. (MI).

Lix, Lisa M. , Joanne C. Keselman, and H. J. Keselman (1996), "Consequences of Assumption Violations Revisited: A Quantitative Review of Alternatives to the One-Way Analysis of Variance "F" Test," *Review of Educational Research*, 66 (4), 579-619.

Lucchiari, Claudio and Gabriella Pravettoni (2012), "The Effect of Brand on EEG Modulation: A Study on Mineral Water," *Swiss Journal of Psychology*, 71 (4), 199-204.

MacInnis, Deborah J. and Valerie S. Folkes (2010), "The Disciplinary Status of Consumer Behavior: A Sociology of Science Perspective on Key Controversies," *Journal of Consumer Research*, 36 (6), 899-914.

Malmivuo, Jaakko and Robert Plonsey (1995), *Bioelectromagnetism: Principles and Applications of Bioelectric and Biomagnetic Fields.* New York, NY: Oxford University Press.

Marshall, Julie (2006), "Interactive Window Shopping: Enchantment in a Rationalized World," *Electronic Journal of Sociology*, 1-12.

Maxwell, Scott E. and Harold D. Delaney (1990), *Designing Experiments and Analyzing Data: A Model Comparison Perspective*: Wadsworth Publishing Company.

McCallion, Michael J. and Benjamin Bennett-Carpenter (2008), "Displays of Faith: Material/Visual Versus Cognitive/Verbal," *Review of Religious Research*, 49 (4), 427-37.

McClure, Samuel M., Jian Li, Damon Tomlin, Kim S. Cypert, Latané M. Montague, and P. Read Montague (2004), "Neural Correlates of Behavioral Preference for Culturally Familiar Drinks," *Neuron*, 44 (2), 379-87.

Medina, J. John (2008), *Brain Rules: 12 Principles for Surviving and Thriving at Work*, Home, and School: Pear.

Miller, William R. and Carl E. Thoresen (2003), "Spirituality, Religion, and Health: An Emerging Research Field," *American Psychologist*, 58 (1), 24-35.

Milosavljevic, Milica, Baba Shiv, Rafal K. Ohme, and Hilke Plassmann (2008), "How the Consumer's Brain Functions: Where Marketing Meets Neuroscience," *American Academy of Advertising.*

Min, Byoung-Kyong, Kwangsu Cho, Jungyeon Sung, and Erin Cho (2014), "Neurophysiological Evidence For The Country-of-Origin Effect: An Event-Related Potential Study," *Neuroreport*, 25 (4), 274-78.

Mokhlis, Safiek (2009), "Relevancy and Measurement of Religiosity in Consumer Behavior Research," *International Business Research*, 2 (3), 75-84.

Morey, Alyssa Choi Tsubokura (2013), Memory For Positive, Negative, and Comparison Ads: Studying Semantic Associations between Candidates and Issues Using EEG (Order No. 3673427), (accessed July 25, 2015), [available at ProQuest Dissertations and Theses Global. http://search.proquest.com/docview/1647746510?accountid=7078]

Morris, Charles G. and Albert A. Maisto (2004), *Introdução à Psicologia* (6th edition). Ribeirão Preto, Brazil: Pearson Education do Brazil.

Muñiz, Albert M., Jr. and Thomas C. O'Guinn (2001), "Brand Community," *Journal of Consumer Research*, 27 (4), 412-32.

Muñiz, Albert M., Jr. and Hope Jensen Schau (2005), "Religiosity in the Abandoned Apple Newton Brand Community," *Journal of Consumer Research*, 31 (4), 737-47.

Murata, Atsuo, Atsushi Uetake, and Yosuke Takasawa (2005), "Evaluation of Mental Fatigue Using Feature Parameter Extracted From Event-Related Potential," *International Journal of Industrial Ergonomics*, 35 (8), 761-70.

Myungeun, Lee and Cho Gilsoo (2009), "Measurement of Human Sensation for Developing Sensible Textiles," *Human Factors & Ergonomics in Manufacturing*, 19 (2), 168-76.

Nelson, James M. (2006), *Religion. Encyclopedia of Multicultural Psychology*. Thousand Oaks, CA: SAGE Publications, Inc.

Newberg, Andrew and Eugene G. D'Aquili (2008), *Why God Won't Go Away: Brain Science and the Biology of Belief*: Random House Publishing Group.

Nittono, Hiroshi (2013), "P1-55. Late Positive Potentials Associated with the Attractiveness of the Appearances of Commercial Goods," *Clinical Neurophysiology*, 124 (8), e35-e35.

Nowlis, David P. and Joe Kamiya (1970), "The Control of Electroencephalographic Alpha Rhythms through Auditory Feedback and the Associated Mental Activity," *Psychophysiology*, 6 (4), 476-84.

Nygard, Roger (1997), "Trekkies," in United States: NEO Motion Pictures.

O'Collins, Gerald and Edward G. Farrugia (2013), A Concise Dictionary of Theology: Paulist Press.

Ohme, Rafel, Michal Matukin, and Beata Pacula-Lesniak. (2011). Biometric Measures for Interactive Advertising Research. *Journal of Interactive Advertising*, 11(2), 60-72.

Ohme, Rafal, Dorota Reykowska, Dawid Wiener, and Anna Choromanska (2010), "Application of frontal EEG asymmetry to advertising research," *Journal of Economic Psychology*, 31 (5), 785-93.

Ohme, Rafal, Dawid Wiener, Dorota Reykowska, and Anna Choromanska (2009), "Analysis of Neurophysiological Reactions to Advertising Stimuli by Means of EEG and Galvanic Skin Response Measures," *Journal of Neuroscience, Psychology, & Economics*, 2 (1), 21-31.

Oostenveld, Robert and Peter Praamstra (2001), "The Five Percent Electrode System for High-Resolution EEG and ERP Measurements," *Clinical Neurophysiology*, 112 (4), 713-19.

Pallant, Julie (2010), *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS*: Allen and Unwin Australia.

Paloutzian, Raymond F. and Crystal L. Park (2013), *Handbook of the Psychology of Religion and Spirituality*, Second Edition: Guilford Publications.

Patterson, John, Carolina M. Owen, Damian Frank, Rebecca Smith, and Peter Cadusch (2004), "Flavour Sensory Qualities and Consumer Perceptions—A Comparison of Sensory and Brain Activity Responses to Flavour Components in Different Populations," *International Journal of Food Science & Technology*, 39 (5), 481-90.

Perrachione, Tyler K. and John R. Perrachione (2008), "Brains and brands: Developing mutually informative research in neuroscience and marketing," *Journal of Consumer Behaviour*, 7 (4/5), 303-18.

Peteet, John R. (1994), "Approaching Spiritual Problems in Psychotherapy: A Conceptual Framework," *Journal of Psychotherapy Practice and Research*, 3 (3), 237-45.

Pflieger, Mark E. and Stephen F. Sands (1996), "Proceedings of the Second International Conference on Functional Mapping of the Human Brain," Vol. 3: *Academic Press*.

Philippe, Alexandre O., Vanessa Philippe, and Gary Kurtz (2011), "The People Vs. George Lucas." Santa Monica, Calif.: Lionsgate.

Pimentel, Ronald W. and Kristy E. Reynolds (2004), "A model for consumer devotion: affective commitment with proactive sustaining behaviors," *Academy of Marketing Science Review*, 5 (1).

Pynta, Peter, Shaun A. S. Seixas, Geoffrey E. Nield, James Hier, Emelia Millward, and Richard B. Silberstein (2014), "The Power of Social Television: Can Social Media Build Viewer Engagement? A New Approach to Brain Imaging of Viewer Immersion," *Journal of Advertising Research*, 54 (1), 71-80.

Ragas, Matthew W. and Bolivar J. Bueno (2011), *The Power of Cult Branding: How 9 Magnetic Brands Turned Customers into Loyal Followers (and Yours Can, Too!)*: Doubleday Religious Publishing Group.

Ravaja, Niklas, Outi Somervuori, and Mikko Salminen (2013), "Predicting Purchase Decision: The Role of Hemispheric Asymmetry Over the Frontal Cortex," *Journal of Neuroscience,* Psychology, and Economics, 6 (1), 1-13.

Ritzer, George (1999), *Enchanting a Disenchanted World: Revolutionizing the Means of Consumption*: Thousand Oaks, CA: Pine Forge Press.

Robinson, Brett T. (2013), "How Steve Jobs Turned Technology—And Apple—Into Religion," (accessed 8/21, 2013), [available at http://www.wired.com/opinion/2013/08/how-jobs-turned-technology-and-media-into-religion/].

Rosenthal, Robert (1991), *Meta-Analytic Procedures for Social Research*: SAGE Publications.

Rossano, Matt J. (2010), "Sacred Brands: Consumerism as Modern Religion," (accessed 4/23, 2013), [available at http://www.huffingtonpost.com/matt-j-rossano/sacred-brands-consumerism_b_789303.html].

Rossiter, John R. and Richard B. Silberstein (2001), "Brain-Imaging Detection of Visual Scene Encoding in Long-term Memory for TV Commercials," *Journal of Advertising Research*, 41 (2), 13-21.

Rothschild, Michael L. and Yong J. Hyun (1990), "Predicating Memory for Components of TV Commercials from EEG," *Journal of Consumer Research*, 16 (4), 472-78.

---- (1990), "Predicating Memory for Components of TV Commercials from EEG," *Journal of Consumer Research*, 16 (4), 472-78.

Rothschild, Michael L., Yong J. Hyun, Byron Reeves, Esther Thorson, and Robert Goldstein (1988), "Hemispherically Lateralized EEG as a Response to Television Commercials," *Journal of Consumer Research*, 15 (2), 185-98.

Rothschild, Michael L., Esther Thorson, Byron Reeves, Judith E. Hirsch, and Robert Goldstein (1986), "EEG Activity and The Processing of Television Commercials," *Communication Research*, 13 (2), 182.

Schau, Hope Jensen and Albert M. Muñiz (2002), "Brand Communities and Personal Identities: Negotiations in Cyberspace," *Advances in Consumer Research*, 29 (1), 344-49.

Schau, Jensen Hope and Albert Muñiz (2006), "A Tale of Tales: The Apple Newton Narratives," *Journal of Strategic Marketing*, 14 (1), 19-33.

Schwibbe, M., A. Breull, and D. Becker (1981), "Peak Centred Power Spectra: A Successful Attempt to Calculate Efficient Parameters in the Alpha Range of EEG," *Electroencephalography and Clinical Neurophysiology*, 52 (5), 497-500.

Segall, Ken (2012), Insanely Simple: *The Obsession That Drives Apple's Success*: Penguin Group US.

Sheth, Jagdish N., Bruce I. Newman, and Barbara L. Gross (1991), "Why We Buy What We Buy: A Theory of Consumption Values," *Journal of Business Research*, 22, 159-70.

Shukor, Abdul S. and Ahmad Jamal (2013), "Developing Scales for Measuring Religiosity in the Context of Consumer Research," *Research in Contemporary Islamic Finance and Wealth Management*, 69-74.

Smart, Ninian (1996), *Dimensions of the Sacred: An Anatomy of the World's Beliefs*. Berkeley: University of California Press.

---- (1978), *The Phenomenon of Religion*: Mowbrays.

---- (1998), *The World's Religions*: Cambridge University Press.

---- (1989), *The World's Religions: Old Traditions and Modern Transformations*. New York, NY: Cambridge UP.

Smith, Shelly (2012). Millennial Consumers' Perceptions of Corporate Social Responsibility. Masters Thesis, Department of Retail and Hospitality Management Texas Tech University,

(accessed July 2, 2015), [available at https://repositories.tdl.org/ttu-ir/bitstream/handle/2346/45349/SMITH-THESIS.pdf?sequence=2]

Smith, Michael E. and Alan Gevins (2004), "Attention and Brain Activity While Watching Television: Components of Viewer Engagement," *Media Psychology*, 6 (3), 285-305.

SPSS Inc. (2006), *SPSS Base 15.0 User's Guide*: SPSS.

Stahl, William A. (1999), *God and the Chip: Religion and the Culture of Technology*: Wilfrid Laurier University Press.

Stark, Rodney and William S. Bainbridge (1996), *A Theory of Religion*: Rutgers University Press.

Stoenescu, Roxana-Denisa G. and Valentina Daniela N. Constantin (2014). The Impact of Origin on Creating a Cult Brand: The Case of Apple. SEA–Practical Application of Science, (03), 123-134.

Tabachnick, Barbara G. and Linda S. Fidell (2012), *Using Multivariate Statistics*. Boston: Pearson Education.

Tajfel, Henri and John C. Turner (2004), "The Social Identity Theory of Intergroup Behavior," in *Political Psychology: Key Readings.*, John T. Jost and Jim Sidanius, eds. New York, NY, US: Psychology Press.

Tan, Jonathan H. W. (2006), "Religion and Social Preferences: An Experimental Study," *Economics Letters*, 90 (1), 60-67.

Tan, Jonathan H. W. and Claudia Vogel (2008), "Religion and Trust: An Experimental Study," *Journal of Economic Psychology*, 29 (6), 832-48.

Tariq, Muhammad, Rabia Ishrat, and Hashim Khan (2011), "A Case Study of Apple's Success with iconic iPod and iPhone," *Interdisciplinary Journal of Contemporary Research in Business*, 3 (1), 158-68.

Thurstone, Louis L and E. L. Chave (1929), *The Measurement of Attitudes: A Psychophysical Method and Some Experiments with a Scale for Measuring Attitude toward the Church*. Chicago: University of Chicago Press

Toepel, Ulrike, Jean-François Knebel, Julie Hudry, Johannes le Coutre, and Micah M. Murray (2012), "Gender and Weight Shape Brain Dynamics during Food Viewing," *PLoS ONE*, 7 (5), 1-9.

Torma, Ryan and Paul Emerson Teusner (2011), "iReligion," *Studies in World Christianity*, 17 (2), 137-55.

Treleaven-Hassard, Shiree, Joshua Gold, Steven Bellman, Anika Schweda, Joseph Ciorciari, Christine Critchley, and Duane Varan (2010), "Using the P3a to Gauge Automatic Attention to Interactive Television Advertising," *Journal of Economic Psychology*, 31 (5), 777-784.

U. S. Census Bureau. (2012), "Statistical Abstract of the United States," (accessed 1/23, 2015), [available at https://www.census.gov/compendia/statab/2012/tables/12s0075.pdf].

Vance, Anthony, Bonnie Brinton Anderson, C. Brock Kirwan, and David Eargle (2014), "Using Measures of Risk Perception to Predict Information Security Behavior: Insights from Electroencephalography (EEG)," *Journal of the Association for Information Systems*, 15 (10), 679-722.

Vecchiato, Giovanni, Laura Astolfi, Febo Cincotti, Fabrizio De Vico Fallani, Domenica M. Sorrentino, Donatella Mattia, Serenella Salinari, Luigi Bianchi, Jlena Toppi, Fabio Aloise, and Fabio Babiloni (2010), "Patterns of Cortical Activity during The Observation of Public Service Announcements and Commercial Advertisings," *Nonlinear Biomedical Physics*, 4, 1-9.

Vecchiato, Giovanni, Laura Astolfi, Fabrizio De Vico Fallani, Febo Cincotti, Donatella Mattia, Serenella Salinari, Ramon Soranzo, and Fabio Babiloni (2010), "Changes In Brain Activity During The Observation of TV Commercials By Using EEG, GSR and HR Measurements," *Brain Topography*, 23 (2), 165-79.

Vecchiato, Giovanni, Laura Astolfi, Alessandro Tabarrini, Serenella Salinari, Donatella Mattia, Febo Cincotti, Luigi Bianchi, Domenica Sorrentino, Fabio Aloise, Ramon Soranzo, and Fabio Babiloni (2010), "EEG Analysis of The Brain Activity during The Observation of Commercial, Political, Or Public Service Announcements," *Computational Intelligence And Neuroscience*, 985867-67.

Vecchiato, Giovanni, Patrizia Cherubino, Anton Giulio Maglione, Maria Trinidad Herrera Ezquierro, Franco Marinozzi, Fabiano Bini, Arianna Trettel, and Fabio Babiloni (2014), "How To Measure Cerebral Correlates of Emotions In Marketing Relevant Tasks," *Cognitive Computation*, 6 (4), 856-71.

Vecchiato, Giovanni, Wanzeng Kong, Anton Giulio Maglione, Patrizia Cherubino, Arianna Trettel, and Fabio Babiloni (2014), "Cross-Cultural Analysis of Neuroelectrical Cognitive and Emotional Variables During the Appreciation of TV Commercials," *Neuropsychological Trends*, 16, 23-29.

Vecchiato, Giovanni, Anton Giulio Maglione, Patrizia Cherubino, Barbara Wasikowska, Agata Wawrzyniak, Anna Latuszynska, Malgorzata Latuszynska, Kesra Nermend, Ilenia Graziani, Maria Rita Leucci, Arianna Trettel, and Fabio Babiloni (2014), "Neurophysiological Tools to Investigate Consumer's Gender Differences during the Observation of TV Commercials," *Computational & Mathematical Methods in Medicine*, 1-12.

Vecchiato, Giovanni, Jlenia Toppi, Laura Astolfi, Fabrizio Vico Fallani, Febo Cincotti, Donatella Mattia, Francesco Bez, and Fabio Babiloni (2011), "Spectral EEG Frontal

Asymmetries Correlate With the Experienced Pleasantness of TV Commercial Advertisements," *Medical & Biological Engineering & Computing*, 49 (5), 579-83.

Vries-Schot, Margreet R. de , Joseph Z.T. Pieper, and Marinus H. F. van Uden (2012), "Mature Religiosity Scale: Validity of a New Questionnaire," *European Journal of Mental Health* 7(1), 57-71.

Walker, Rob (2004). The Old New Thing. *The New York Times Magazine*, 32.
Wang, Jing and Weiwei Han (2014), "The Impact of Perceived Quality on Online Buying Decisions: An Event-Related Potentials Perspective," *Neuroreport*, 25 (14), 1091-98.

Wang, Yong Jian, Monica D. Hernandez, Michael S. Minor, and Jie Wei (2012), "Superstitious Beliefs in Consumer Evaluation of Brand Logos," *European Journal of Marketing*, 46 (5), 712-32.

Wang, Yong Jian and Michael S. Minor (2008), "Validity, Reliability, and Applicability of Psychophysiological Techniques in Marketing Research," *Psychology and Marketing*, 25 (2), 197-232.

Weinstein, Sidney, Valentine Appel, and Curt Weinstein (1980), "Brain-Activity Responses to Magazine and Television Advertising," *Journal of Advertising Research*, 20 (3), 57-63.

Wieneke, G. H., C. H. A. Deinema, P. Spoelstra, W. Storm Van Leeuwen, and H. Versteeg (1980), "Normative Spectral Data on Alpha Rhythm in Male Adults," *Electroencephalography and Clinical Neurophysiology*, 49, 636-45.

Wilkes, Robert E., John J. Burnett, and Roy D. Howell (1986), "On the Meaning and Measurement of Religiosity in Consumer Research," *Journal of the Academy of Marketing Science*, 14 (1), 47.

Wheaton, Blair, Bengt Muthen, Duane F. Alwin, and Gene F. Summers (1977), "Assessing Reliability and Stability in Panel Models," *Sociological Methodology*, 8 (1), 84-136.

Worthington, Everett L., Jr., Nathaniel G. Wade, Terry L. Hight, Jennifer S. Ripley, Michael E. McCullough, Jack W. Berry, Michelle M. Schmitt, James T. Berry, Kevin H. Bursley, and Lynn O'Connor (2003), "The Religious Commitment Inventory—10: Development, Refinement, and Validation of a Brief Scale for Research and Counseling," *Journal of Counseling Psychology*, 50 (1), 84-96.

Wu, Yi-Chia and Michael S. Minor (2012), "Neuromarketing Stimuli, Methods and Results: A State-of-the-Art Review," working paper, Department of Marketing, The University of Texas-Pan American.

Yılmaz, Bülent, Sümeyye Korkmaz, Dilek Betül Arslan, Evrim Güngör, and Musa H. Asyalı (2014), "Like/dislike Analysis Using EEG: Determination of Most Discriminative Channels and Frequencies," *Computer Methods & Programs in Biomedicine*, 113 (2), 705-13.

Young, Charles (2002), "Brain Waves, Picture Sorts, and Branding Moments," *Journal of Advertising Research*, 42 (4), 42-53.

Young, Jeffrey S. (1988), *Steve Jobs: The Journey is the Reward*: Scott, Foresman.

Zeal. (2012), "Merriam-Webster's Collegiate Dictionary," in *Credo Reference*. Springfield: Merriam-Webster.

APPENDICES

APPENDIX A

APPENDIX A

COVER LETTER

This survey is being conducted by Yi-Chia Wu, Ph.D. candidate in Marketing at The University of Texas-Pan American (email: ywu@utpa.edu). The faculty advisor on this study is Dr. Michael Minor (email: msminor@utpa.edu) from the Marketing Department. The purpose of this study is to examine whether a relationship can develop between the brand and its users. This survey should take about 10-15 minutes to complete. Participation in this research is completely voluntary. You must be at least 18 years old to participate. If you are not 18 or older, please do not complete the survey.

There are two phases of this study. At the end of the survey, you will be asked to provide your name and email if you agree to participate in the second study. You will receive a $10 Starbucks gift card for your participation in the second study. In order to be eligible to participate in the second study you must be at least 18 years of age or older and must be a U.S. Citizen or Legal Permanent Resident. If you are not, please do not complete the survey for the second study, or notify the researcher.

All survey responses that we receive will be treated confidentially and stored on a secure server. However, given that the surveys can be completed from any computer (e.g., personal, work, school), we are unable to guarantee the security of the computer on which you choose to enter your responses. As a participant in our study, we want you to be aware that certain technologies exist that can be used to monitor or record data that you enter and/or websites that you visit.

Any individually identifiable response will be securely stored and will only be available to Yi-Chia Wu, the researcher. Your individual answers are strictly confidential and will not be seen by anyone other than researchers nor will your responses be reported individually under any conditions.

This research has been approved by the Institutional Review Board for Human Subjects Protection (IRB# 2013-147-12). If you have any questions about your rights as a participant, or if you feel that your rights as a participant were not adequately met by the researcher, please contact the IRB at 956-665-2889 or irb@utpa.edu. You are also invited to provide anonymous feedback to the IRB by visiting www.utpa.edu/IRBfeedback.

APPENDIX B

QUESTIONNAIRE

Please answer the following questions first before proceeding this survey:

Filtering Questions: Religious Belief

1. What is your religious belief?

- Catholicism
- Islam
- Protestantism
- Buddhism
- Judaism
- I don’t have any

Filtering Questions: User Experience

2. Which branded products have you used before? (Check all that apply)

- Nokia
- Apple
- HTC
- Samsung
- LG
- BlackBerry

Demographics

1. What is your gender?

- Male
- Female

2. Which year were you born?

3. What is your annual household income?

- Less than $25,000
- $25,000-$34,999
- $35,000-$49,999
- $50,000-$74,999
- $75,000-$99,999
- More than $100,000

4. What is your highest education level?

- Graduated high school or equivalent
- Some college, no degree
- Associate degree
- Bachelor's degree
- Post-graduate degree

5. In which state do you currently reside?

- Alabama (1)
- Alaska (2)
- Arizona (3)
- Arkansas (4)
- California (5)
- Colorado (6)
- Connecticut (7)
- Delaware (8)
- District of Columbia (9)
- Florida (10)
- Georgia (11)
- Hawaii (12)
- Idaho (13)
- Illinois (14)
- Indiana (15)
- Iowa (16)
- Kansas (17)
- Kentucky (18)
- Louisiana (19)
- Maine (20)
- Maryland (21)
- Massachusetts (22)
- Michigan (23)

- Minnesota (24)
- Mississippi (25)
- Missouri (26)
- Montana (27)
- Nebraska (28)
- Nevada (29)
- New Hampshire (30)
- New Jersey (31)
- New Mexico (32)
- New York (33)
- North Carolina (34)
- North Dakota (35)
- Ohio (36)
- Oklahoma (37)
- Oregon (38)
- Pennsylvania (39)
- Rhode Island (41)
- South Carolina (42)
- South Dakota (43)
- Tennessee (44)
- Texas (45)
- Utah (46)
- Vermont (47)
- Virginia (48)
- Washington (49)
- West Virginia (50)
- Wisconsin (51)
- Wyoming (52)
- I do not reside in the United States (53)

Catholic Scale

Please indicate the degree of your agreement in the following statements (1= Strongly Disagree; 10 = Strongly Agree).

Strongly Disagree									Strongly Agree
1	2	3	4	5	6	7	8	9	10

Practical/Ritual Dimension

1. I pray the rosary every day.
2. I rarely go to church.
3. I go to Mass every week.
4. I pray every day.
5. I pray to Saints.
6. I pray every day without the need to go to Mass.

Experiential/Emotional Dimension

7. Religion is relevant to my deepest feelings.
8. Any spiritual experience could be considered a sign connecting with God.
9. Believing in my religion is comforting.
10. My religious belief makes me feel secure.
11. I have felt the presence of God.

Narrative/Mythic Dimension

12. The story of Jesus Christ shapes my belief.
13. I think the stories in the Bible are well documented.
14. I believe in the miracles written in the Bible.
15. The Creation Story in the Bible is a symbolic narrative of how the world began.
16. The stories in the Bible define who I am.

Doctrinal/Philosophical Dimension

17. I spend time trying to grow in the understanding of my faith.
18. The Ten Commandments of The Bible are what I believe in.
19. I believe God created the universe.

Ethical/Legal Dimension

20. Religion is concerned with my greatest values.
21. My religion guides my judgment of right and wrong.
22. Religion is the foundation for establishing ethics.
23. My religious belief helps me to make ethical decisions.

Social/Institutional Dimension

24. I make financial contributions to my religious organization.
25. I enjoy working in the activities of my religious affiliation.
26. I keep well informed about my local religious group.
27. I have influence in the decisions of my local religious group.

Material Dimension

28. I often purchase books about religion.
29. I purchase items from religious bookstores regularly.
30. I watch religiously-themed shows and speeches frequently.
31. I listen to religiously-themed music daily.
32. I collect religiously-themed items.
33. How many years have you practiced your religion?

Apple Scale

Please indicate the degree of your agreement in the following statements (1= Strongly Disagree; 10 = Strongly Agree).

Strongly Disagree									Strongly Agree
1	2	3	4	5	6	7	8	9	10

Practical/Ritual Dimension

1. I do not like Apple, Inc., so I do not care to buy Apple products.

2. I like the Apple brand.

3. I only use Apple products.

4. I really worship Apple, Inc.

5. I often browse Apple's online store.

Experiential/Emotional Dimension

6. I consider Apple products sacred.

7. My relationship with the Apple brand is real.

8. If I don't have my Apple products nearby, I feel a sense of emptiness.

9. I think about Apple, Inc. all the time.

10. I have a profound relationship with the Apple brand.

11. I love using my Apple products.

Narrative/Mythic Dimension

12. The stories about Steve Jobs starting Apple, Inc. tell everything about the company.

13. I am affected by the stories about Steve Jobs.

14. I am totally captivated by the stories about Apple, Inc.

15. Stories about Steve Jobs are inspiring.

Doctrinal/Philosophical Dimension

16. The simplicity of Apple products is the source of Apple's growth.

17. Apple products are always ahead of others in innovation.

18. Apple, Inc. creates products for creative types.

Ethical/Legal Dimension

19. Apple, Inc. does not cheat its customers.

20. I don't think Apple, Inc. is truthful to its customers.

21. The legal issues against Apple, Inc. do not affect my opinions about the company.

22. Any decision Apple, Inc. has made is legal.

23. Apple, Inc. sets the standard for patent protection.

Institutional/Social Dimension

24. Owning Apple products gives me a sense of belonging.

25. Seeing people use Apple products makes me feel good.

26. I like to hang out with people who use Apple products.

27. Owning Apple products makes me feel powerful.

28. I am strongly supported by the Apple (online) community.

Material Dimension

29. I am a loyal customer of Apple, Inc.

30. I find Apple products appealing.

31. Apple stores attract my attention.

32. How many years have you owned your Apple product(s)?

33. What are the Apple products you own? (Check all that apply)

- □ iPhone (1)
- □ iPad (2)
- □ Mac Laptop (3)
- □ Mac Desktop (4)
- □ iPod (5)

- Apple TV (7)
- Other. Please specify: (6) _____

Study 2

By completing phase 2 of this study, you will be eligible to receive compensation as a token for your time. A $10 Starbucks gift card will be given to you after completing phase 2. Please note that any payment(s) you receive for participation in phase 2 is considered income for tax purposes. If you are an international student and are working 20 hours a week, accepting compensation for participation in this study may affect your visa status. If you do not wish to participate in phase 2, you do not answer questions asking for your name and email. If you wish to participate in phase 2, please answer question 2 and 3 for your name and email.

1. Are you interested in participating in phase 2 of the research, which includes an EEG reading while viewing religious and Apple pictures?

- Yes
- No

2. If so, what is your name?
3. If so, what is your email?

Thank you for your participation. Your answer is very important to this study.

APPENDIX C

EMAIL SCRIPT FOR RECRUITING PARTICIPANTS FOR PHASE II – FIRST EMAIL

Dear_____ (name),

Thank you very much for your willingness to participate in this experiment I'm contacting you because of the online survey you took one week ago. I'm conducting for my Doctoral Dissertation in Marketing. The study is about how devotees perceive their brand consumption. I have openings on _____ (day) at _____ (time). I was wondering if you could come to help us by participating in our study. If it is not convenient for you, please let me know the best time for you.

You will be asked to come to BUSA Room 117 to participate in our Phase II experiment. This study has been approved by the IRB (irb@utpa.edu) and it takes about fifty minutes. Please wash and dry your hair on the previous night before the experiment day. Please let me know if you have any concerns beforehand.

I am looking forward to hearing from you. Thank you in advance. I'll email you the night before with a reminder.

Regards,

Yi-Chia Wu
Ph.D. Candidate
The University of Texas-Pan American
Department of Marketing

EMAIL SCRIPT FOR RECRUITING PARTICIPANTS FOR PHASE II – SECOND EMAIL (REMINDER)

Dear_____ (name),

This is a friendly reminder for the Phase II experiment that you committed to participate in on _____ (day) at _____ (time). If for some reason you're unable to make it, please e-mail me at ywu@utpa.edu to reschedule.

APPENDIX D

INFORMED CONSENT FORM

Religious Consumption

We are conducting a research study to examine whether a brand can develop its relationship with users and this connection can be interpreted by consumers as validating their existence. This study is being conducted by Yi-Chia Wu, Ph.D. candidate in Marketing (Email: ywu@utpa.edu, Address: The University of Texas-Pan American, Department of Marketing, COBA Building, Rm. 231A), as partial fulfillment of a Doctoral degree under the faculty advisor Dr. Michael S. Minor (Email: msminor@utpa.edu; Phone: 956-665-3379). You are contacted to participate in this study because of your previous participation in the online survey two weeks ago, and are willing to continue with this study.

By completing this experiment, you will be eligible to receive compensation as a token for your time. A $10 gift card will be given to you after completing this study. Please note that any payment(s) you receive for participation in this study is considered income for tax purposes. If you are an international student and are working 20 hours a week, accepting compensation for participation in this study may affect your visa status.

This study is a single 50-minute session. This procedure includes the application of alcohol pads, gel, and attachments of sensors on your earlobes and two spots on the scalp. There will not be any discomfort during the process. Next, you will view a series of pictures on the computer. Your interaction with these pictures requires no involvement on your part. This session will be video recorded for research purposes. You will sign a separate permission form for the video recording.

There is no anticipated risk or direct benefit for you to participate in this study. However, this study is expected to increase knowledge in the fields of marketing, theology, and sociology. The completion of your participation is highly appreciated and will contribute to the significant findings.

Your participation in this study is voluntary; you may discontinue your participation at any time without penalty. If for any reason you decide that you would like to discontinue your participation, simply tell the researcher that you wish to stop.

Your data will remain confidential, and your data will be coded with a code book stored separately to link participants with the coded data. There is no exposure of your direct contact. Identifiable subject records will be securely stored in the PI's office computer that is not accessible except with the PI's credentials.

This research has been reviewed and approved by the Institutional Review Board for Human Subjects Protection (IRB). If you have any questions about your rights as a participant, or if you feel that your rights as a participant were not adequately met by the researcher, please contact the IRB at 956.665.2889 or irb@utpa.edu. You are also invited to provide anonymous feedback to the IRB by visiting www.utpa.edu/IRBfeedback.

By signing below, you indicate that you are voluntarily agreeing to participate in this study and that the procedures involved have been described to your satisfaction. The researcher will provide you with a copy of this form for your own reference. In order to participate, you must be at least 18 years of age. If you are under 18, please inform the researcher.

_____ ____/_____/_____

Participant's Signature Date

APPENDIX E

PHOTOGRAPH/VIDEOTAPE RELEASE FORM

Religious Consumption

Researcher: Yi-Chia Wu
Office Phone: (956) 665-7231
Email Address: ywu@utpa.edu
Faculty Advisor: Dr. Michael S. Minor
Office Phone: (956) 665-3379
Email Address: msminor@utpa.edu

I hereby give my permission to Yi-Chia Wu to use any photos or videotape material taken of myself during her research on Religious Consumption. The photos and/or videotape material will only be used for research purposes and may be used in conference presentations. As with all research consent forms, I understand that I may at any time withdraw permission for photographs and/or video footage of me to be used in this research project. I acknowledge that there is no compensation for allowing myself to be audiotaped.

The digital video recordings will last 50 minutes for each participant and will be securely saved in Yi-Chia Wu's office computer at BUSA Room 231A. No one other than the investigator will have access to the data. After the data is collected and transcriptions are made, the data will be kept in the researcher's office computer for three years and after that the files will be destroyed.

Please print your name:

_____

Your Signature: _____

Date: _____

Please keep this sheet for your reference.

APPENDIX F

SAMPLE SIZE OF EEG MARKETING STUDIES FROM 1971-2014

#	Author	Year	S*	#	Author	Year	S
1	Krugman	1971	1	33	Lucchiari and Pravettoni	2012	26
2	Appel, Weinstein, and Weinstein	1979	30	34	Aurup and Akgunduz	2012	11
3	Weinstein, Appel, and Weinstein	1980	30	35	Hedgcock, Vohs, and Rao	2012	16
4	Rockey, Greene, and Perold	1980	24	36	Toepel, et al.	2012	24
5	Cacioppo and Petty	1982	40	37	Jones, Childers, and Jiang	2012	38
6	Reeves, et al.	1985	26	38	Adhami	2013	30
7	Rothschild, et al.	1986	26	39	Ravaja, Somervuori, and Salminen	2013	33
8	Rothschild, et al.	1988	21	40	Khushaba, et al.	2013	18
9	Bogart and Tolley	1988	14	41	Nittono	2013	18
10	Rothschild and Hyun	1990	21	42	Balconi, Stumpo, and Leanza	2014	34
11	Silberstein, et al.	2000	35	43	Dmochowski, et al.	2014	12
12	Rossiter and Silberstein	2001	35	44	Vecchiato, et al.	2014	20
13	Young	2002	100	45	Vecchiato, et al.	2014	15
14	Simons, et al.	2003	25	46	Kuan, Zhong, and Chau	2014	18
15	Patterson, et al.	2004	46	47	Vecchiato, et al.	2014	28
16	Smith and Gevins	2004	10	48	Lee, et al.	2014	19
17	Murata, Uetake, and Takasawa	2005	7	49	Cheung, Law, and Yip	2014	15
18	Babiloni, et al.	2006	10	50	Yilmaz, et al.	2014	15
19	De Vico Fallani, et al.	2008	19	51	Horska and Bercik	2014	15
20	Bourdaud, et al.	2008	9	52	Kim, Kim, and Kim	2014	4
21	Astoffi, et al.	2008	10	53	Gountas, et al.	2014	20
22	Ohme, et al.	2009	45	54	Wang and Han	2014	20
23	Astolfi, et al.	2009	13	55	Lawrence, Ciorciari, and Kyrios	2014	24
24	Lee and Cho	2009	20	56	Min, et al.	2014	15
25	Jenkins, Brown, and Rutterford	2009	16	57	Pynta, et al.	2014	36
26	Ohme, et al.	2010	45		**Wu**	**2015**	**60**
27	Treleaven-Hassard et al.	2010	28				
28	Vecchiato, et al.	2010	13				
29	Vecchiato, et al.	2010	15				
30	Cook, et al.	2011	24				
31	Vecchiato, et al.	2011	11				
32	Huffmeier, et al.	2012	47				

Number of papers

S* Numbers of Subjects

APPENDIX G

EEG CALCULATION USING ONE-WAY ANOVA

1. Alpha baseline was recorded
2. Alpha waves in Seven Dimensions were recorded and coded as: ARA (Apple Ritual Alpha), AEA (Apple Emotional Alpha), ANA (Apple Narrative Alpha), ADA (Apple Doctrinal Alpha), ALA (Apple Legal Alpha), AIA (Apple Institutional Alpha), AMA (Apple Material Alpha)
3. The same coding applies to Catholic Alpha wave recording: CRA (Catholic Ritual Alpha), CEA (Catholic Emotional Alpha), CNA (Catholic Narrative Alpha), CDA (Catholic Doctrinal Alpha), CLA (Catholic Legal Alpha), CIA (Catholic Institutional Alpha), CMA (Catholic Material Alpha)
4. ARA_Baseline (percentage change) = (ARA-Alpha Baseline)/Alpha Baseline *100
5. Note: ARA-Alpha Baseline is negative, which is normal because the Alpha wave is supposed to reduce when subjects started to pay attention to the stimuli. Therefore, the formula of (ARA-Alpha Baseline)/Alpha Baseline *100 is expected to be negative.
6. Use One-Way ANOVA to compare ARA_Baseline (percentage) as well as other 6 dimensions in Apple and Catholic stimuli between two groups each time.

BIOGRAPHICAL SKETCH

Yi-Chia Wu earned her Ph.D. in Business Administration with an emphasis on marketing from 2010-2015 at The University of Texas–Pan American. Prior to entering the Ph.D. program, Yi-Chia received an MSc in Finance at Queen's University of Belfast, UK, an MA in Linguistics at the University of Aberdeen, UK, and an MBA at The University of Texas–Pan American. In addition, she has worked as an instructor in several universities in Taiwan, as a financial journalist, and as an insurance advisor before coming to the United States. With her tri-lingual background (Chinese, Taiwanese, and English), she decided to pursue marketing and researched consumer behavior in the second year of her MBA program.

Yi-Chia became a published author during her studies at The University of Texas–Pan American. She has published in the *IVEY Business Journal* and subsequently had this article appear in *Harvard Business Review*. She has presented at regional, national, and international conferences of the American Marketing Association, the Academy of Marketing Science, and the Association for Consumer Research, as well as at an Interdisciplinary Symposium on Decision Neuroscience conference. She assisted in organizing regular meetings of the multi-disciplinary Neuroscience Interest Group from various departments at The University of Texas–Pan American. In Fall 2014, Yi-Chia accepted a position as an Assistant Professor of Marketing at Tarleton State University, a member of the Texas A&M University System.