DORON MALKA

THE PLACEBO EFFECT OF BRANDS

A DOCTORAL DISSERTATION

BRAND PLACEBO AND SPILLOVER EFFECT: THE IMPACT OF BRAND PERCEPTION ON CHILDREN'S PERFORMANCE IN A 50-METER RUN

Doctoral Dissertation Research

Submitted to the
Faculty of Argosy University, Phoenix Campus
Graduate School of Business and Management

In Partial Fulfillment of
the Requirements for the Degree of

Doctor of Business Administration

by

Doron Malka

November, 2014

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Department: Graduate School of Business and Management

ABSTRACT

The purpose of this study was to demonstrate that a positive brand perception and affinity can trigger a placebo response that directly impacts participants' performance in a 50-meter run. This quasi-experimental, multi-stage experiment included 177 participants, ages 9 to 13 years old, and consisted of four repeated measurements. A baseline measure preceded an experimental test, in which all participants ran with the exact same brand and style of a running shoe—first with disguised brand elements, and following a conditioning intervention in which the brand's identity was revealed, half ran with what was described as the "real" brand, while the other half continued to run with the disguised brand described as the "knockoff" shoe. The study conclusively demonstrates that participants who ran with the "real" brand expressed high performance expectations and motivation that ultimately created a placebo effect that was manifested by better performance scores. Conversely, participants who continued to run with what they perceived to be the "knockoff" brand, expressed low performance expectations and motivation, and experienced a placebo spillover effect that was manifested by continuously deteriorating performance scores. A repeated baseline test was conducted seven days after the experimental test to investigate the longitudinal characteristics of the placebo and spillover effects. This study was instrumental, as it introduced three new elements to the research of the placebo effect in marketing: the brand placebo spillover effect; the longitudinal attributes of the placebo and spillover effects; and the manifestation of physiological brand placebo and spillover effects in young children.

ACKNOWLEDGEMENTS

It is Jerusalem, 1973. I am seven years old and my parents buy me a new pair of running shoes. The most talked about brand of running shoes in school. "These shoes are so fast!" I proudly tell my friends, as I randomly and frequently sprint up and down our street—truly believing that I've become a faster runner. Fast-forward 41 years, San Diego, 2014. I suggest in this dissertation that feeling faster with my running shoes was not only in my head; they actually made me run faster. A circle is closed.

Naturally, I must acknowledge my parents, Rosette and Albert Malka, first, for having the foresight to buy me running shoes that would ultimately turn into a Doctorate dissertation, and then for their dedication (many times at their own expense) to the success and happiness of my brothers, my sister, and I. No words could adequately express my love and admiration for my parents, and I hope that achieving this milestone in my life fills them with pride and serves as a small token of my eternal gratitude.

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This study focused on children, and would not have been possible without the cooperation of the 200 students who participated in my experiment, and their parents who allowed them to do so—my sincere gratitude to each and every one of them. Additionally, I would like to express my utmost appreciation to Thierry Pasquet,

Principal of La Petite École, and Jennifer Carlson, John Ohagan, and Kyle Smith, PE teachers at Mesa Verde Middle School, for their generous support, dedication of time and resources, and collaboration in conducting the experiment in their schools. Their unconditional kindness made this study possible.

I would like to thank my amazing kids, Matan, Maya, Sophia and Lior for their constant support throughout this journey—although they were convinced that voluntarily choosing to go back to school was a good indication that something is truly wrong with me. Big thanks are also due to my incredible staff at Ameba Marketing for enduring my sleep-deprived agitation and encouraging me nonetheless.

Lastly, but most importantly, I would like to thank my dear wife, Ursula Malka. While a lot of people made this journey possible, she was truly my trusted chaperon every step of the way. Her unconditional and relentless support, enthusiasm and encouragement from the moment I shared with her my intent to embark on this journey, until the day I successfully defended my dissertation three years later, were nothing but exemplary. She created and respected the time and space I needed for my studies, and was genuinely involved in the progress of each chapter of the dissertation, inspiring me to shoot for nothing short of perfection. If it was even possible, my love and admiration for my wife only grew deeper through this experience. I am truly blessed!

The past three years of study and this dissertation are a gift I gave myself. A gift that celebrates academic curiosity and the constant yearn for knowledge. I hope it serves as an inspiration.

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CHAPTER ONE: INTRODUCTION

Problem Background

Placebo is a well-known phenomenon. The most familiar incidents are associated with a sugar pill with no medicinal ingredients given to patients who subsequently report improvement in their health status, believing all along that they have been given real medicine. The placebo phenomenon is mostly associated with medical and psychological research, and was probably demonstrated long before it was clearly recognized and acknowledged.

Despite the undisputed recognition of the placebo effect in the medical field, as reflected by its mandated use as a control method in every clinical research or trial for new drugs, it is still approached with a certain measure of skepticism in other fields of research (Beedie, 2007). While placebo research in the medical field dates back almost two centuries, its exploration in other disciplines is a phenomenon of only the past three decades.

From research demonstrating how consumers' fondness of a particular beer disappears when they consume the same beer under a different label (Allison & Uhl, 1964), and individuals rating the taste of Coke dramatically lower when consumed from an unbranded cup (McClure, Tomlin, Cypert, Montague, & Montague, 2004), to women experiencing an increased body temperature when wearing a labeled Hermes shawl versus wearing the same shawl unlabeled (Shiv, Carmon & Ariely, 2005a), conclusive empirical findings have propelled the acceptance of the placebo effect from merely an ignored expression of a self-fulfilling prophecy to an important driver of consumer behavior (Beedie, 2007).

The first known documentation of the placebo effect was found in research conducted in 1955 by Henry Beecher, who found that during the second World War, injured soldiers experienced significant pain relief, believing that they were treated with real medicine when in fact, due to a scarcity of morphine, they were injected with saline solution (as cited in Vallance, 2006). The research of the placebo effect has expanded, in a true sense, to the marketing field only in the past decade. Shiv, Carmon, and Ariely (2005a) introduced a price placebo and demonstrated that discounted energy drinks were less effective than full-priced energy drinks in impacting alertness, focus and performance, and in creating a physiological reaction, such as increased blood pressure.

Shiv et al.'s (2005a) series of experiments opened the field to a number of researchers (Irmak, Block, & Fitzsimons, 2005; Amar, Ariely, Bar-Hillel, Carmon, & Ofir, 2011) who expanded the investigation of the placebo effect in marketing, and demonstrated in their respective research studies that brand perception, unique product attributes, and consumers' manipulated expectations, directly influenced their experiences and quality evaluations of the products they were using. Similarly, Irmak et al. (2005a) investigated the placebo effect in branded energy drinks, demonstrating that participants who expected impact by an energy drink experienced increased blood pressure, alertness, and focus when drinking a placebo energy drink (a drink with no caffeine or other energy producing elements).

To understand these findings, the concepts of brand and branding must first be explored. Contrary to common belief, brands are not under the control of companies or marketers. They are, as Keller (2003) argued, a concept created in the mind of consumers and are essentially a byproduct of consumers' personal experiences with the

company and the benefits they derive from its products. These personal experiences and derived benefits, positive or negative, amalgamate to an associative memory, which effectively defines the brand in the consumer's mind (Irmak, 2007).

Provided that brands are created in the mind of consumers, and are contingent upon personal experiences, they are inevitably impacted by extrinsic factors, such as the consumer's objective physical and socio-economic environment, as well as subjective, intangible influences induced by uniquely crafted marketing messages, product appearance, advertising and other promotional campaigns. Germane to these intangible influences is the concept of herding, a psychological phenomenon defined as the tendency of individuals, typically as a response to uncertainty, to follow and emulate group behaviors, assigning greater value and rationale to the combined experiences of the crowd than to their own (Keynes, 1930; Baddeley, 2010).

These intrinsic and extrinsic influences, some conscious and some non-conscious, create a unique brand association in the mind of the consumer and assign product attributes, quality, and performance expectations that may not have been even claimed and communicated by the company or the product itself. According to Keller (2003), these brand associations act as priming agents in the consumer's purchasing process, favorably or unfavorably influencing the overall experience and ultimate satisfaction from the purchased product.

In psychology, this phenomenon is referred to as observer-expectancy effect (Rosenthal, 1994) in which a reputation bias directly impacts perception. The brand image created in the mind of consumers is essentially the reputation they associate to it. This reputation directly affects expected product performance and experience (Amar et

al., 2011). Makens (1965) demonstrated this effect in his renowned experiment in which diners rated the taste of a branded turkey significantly higher than that of an unbranded turkey, not realizing that they were eating the same piece of meat. Similarly, Allison and Uhl's (1964) experiment found that participants who noted no significant difference between various beers' taste when the beer labels were disguised, reported major differences between the same beers when brand labels were visible.

Makens' (1964) and Allison and Uhl's (1964) findings represent a conceptual breakthrough in the study of the placebo effect in marketing, for they uphold that brands are not merely an abstract concept, rather they directly and tangibly impact product performance and consumers' physiological experience (Amar et al., 2011).

This study juxtaposes the placebo effect with the concept of brand power, and adds unexplored elements (such as the placebo spillover effect) to other research, which already demonstrated that the placebo phenomenon is present and effective, not only in the medical sciences field, but also in the field of marketing. Further, this study demonstrated that psychological reactions to brands and brand messages lead to physiological outcomes and ultimately affect product performance. In order to do so, this study explored the mechanism of the placebo effect, focusing on three essential elements: expectancy theory, classical conditioning and motivation (Geers, Weiland, Kosbab, Ladrey, & Hefer, 2005; Irmak, 2007), and then highlighting the impact of the placebo spillover effect of the brand on physical performance.

Expectancy theory illustrates a basic human behavior enabling the placebo effect. Placebo works because we expect it to (Stewart-Williams & Podd, 2004). More commonly understood as self-fulfilling-prophecy, the placebo prompts an expectation for

a certain outcome, and that outcome is ultimately achieved because of the expectation. Therefore, according to Stewart-Williams and Podd (2004), placebos are expectation triggers that subsequently cause the placebo effect.

Classical conditioning, or priming, is another theory used to explain the placebo effect. Conditioning was probably best illustrated by Pavlov in his 1927 experiment commonly known as Pavlov's dogs. In this experiment, the dogs were salivating every time they heard the sound of a bell that had been repeatedly used prior to feeding time (Irmak, 2007). To explain the phenomenon, Irmak et al. (2005) suggested that when unconditioned stimuli (such as a bell ring) are used repeatedly, it becomes conditioned stimuli (trigger), which leads to a conditioned response (salivation).

Other researchers (Berns, 2005; Stewart-Williams, & Podd, 2004) offered a different point of view on the theory of classical conditioning, and argued that conditioning is not merely a non-conscious response, rather, it can sometimes trigger conscious expectations and measurable physiological response.

Price and Fields (1997) and Benedetti, Pollo, and Colloca (2007) supported this view and offered evidence for expectancy-triggered conditioning response. Following a series of studies on the impact of patient conditioning on physiological reaction to medication and placebo, they demonstrated that when patients are conditioned regarding a certain medication by physicians, trusted word-of-mouth, newspaper article, advertising or other external sources, they build a strong belief in the efficacy of that medication, which results in a significantly better outcomes (Kleinman, Guess, & Wilentz, 2002).

From a motivational perspective, the placebo effect is simply the outcome of a participant or patient's wish to feel better or to reduce anxiety (Irmak, 2007; Price &

Fields, 1997). Kinle and Kinle (1996) concurred and argued that the placebo effect may be the result of the individual's desire to cooperate and accommodate the research or the treatment, believing that this might yield better outcomes. Geers, Weiland, Kosbab, Ladrey, and Hefer (2005) expanded the motivational perspective and introduced goal activation as an important element determining the placebo effect. They argued that individual's current goals determined the success or failure of the placebo. They claimed further that if the individual's goals were in sync with the purpose of the placebo, the placebo effect would be high.

Purpose of the Study

This study attempted to demonstrate that brand recognition and image can create consumer conditioning that, coupled with expectation and motivation, directly impacts performance with the product, of not only the person using the brand, but also, through the spillover effect, of the one not using it. Considering its prevalence in our daily lives, relatively little academic investigation has been conducted in the area of placebo and marketing, and to a much lesser extent, the placebo spillover effect. While the research of Makens (1964), Allison and Uhl (1964), and more recently, Amar, Ariely, Bar-Hillel, Carmon, and Ofir (2011), studied the impact of brand recognition and perception on consumers' psychological and physiological reactions, research of the placebo effect in marketing (Shiv et al., 2005a; Berns, 2005; Irmak, 2007) mainly focused on marketing actions (price promotion, advertising, unique product features, etc.) as triggers to placebo effect among consumers.

This study builds upon Makens' (1964), Allison and Uhl's (1964), and Amar et al.'s (2011) experiments, focusing on the placebo effect of brand recognition and

perception. Further, this study utilized elements of Shiv et al. (2005a), and Irmak's (2007) theory of the placebo effect of marketing action. According to this theory, brand perception evokes specific consumer expectations, which can alter the actual efficacy of the marketed product. Further, this study followed Berns' (2005) hypothesis that when the placebo effect extends to behavior, it is no longer only in the head, but becomes real and measurable.

In addition to demonstrating that the placebo effect in marketing occurs even at a young age, this study enhances the existing research in two key areas:

1. While previous studies focused on specific product marketing elements, such as price (Shiv et al., 2005a), and taste (Makens, 1965; Allison & Uhl, 1964), this study demonstrated that merely brand perception (and not necessarily experience, action, or a specific product attribute) can create a placebo effect that leads to a physiological reaction manifested by improved running scores among children.
2. This study demonstrated that the placebo effect generated by the brand carries a spillover effect, impacting also the performance of individuals who are exposed to the brand, but do not utilize it.
3. This study investigated the longevity of the placebo and spillover effects in marketing, a factor that has not been studied thus far. By repeating the experiment seven days after its initial introduction, only this time without the placebo element, the study revealed whether a placebo-induced performance and the spillover effect are maintained over time, or whether the performance is retroceded to original values.

Research Questions

Previous research established rather effectively that marketing actions, such as advertising (Irmak, 2007), sales promotions (Shiv et al., 2005a), and changing pricing strategies (Rao & Monroe, 1989; Shiv et al., 2005a) not only impact consumers' perceptions of product quality, but actual, tangible benefits from the product, such as better taste or higher energy level.

Conversely, not enough research has been focused on mere brand perception impact on consumers' performance (rather than perceived product performance) with activities, such as running, assisted by the product, but solely contingent upon it. In addition, all studies to date focus on adult participants (over 18 years old). These two factors lead to the following research question, which were investigated in this study:

RQ1: Can brand recognition and perception lead to a placebo response that impacts product performance and efficacy among school children?

While limited research has been conducted regarding brand placebo effects, virtually no research has been conducted regarding the possibility of a brand placebo spillover effect. While Kendall (2003), Beedie (2007), Fletcher (2010), and others demonstrated the spillover phenomenon in education, sports and psychology, no research was identified as specifically addressing the possibility of placebo spillover effect of brands on performance. This study highlighted the spillover phenomenon, juxtaposed it with the placebo effect of the brand, and explored its effect on subjects' performance. To that end, the following research question was investigated:

RQ2: Does the brand placebo effect, demonstrated in RQ1, carry a spillover effect that impacts the performance of children who were exposed to the brand, but are unable to use it?

Finally, while all research thus far demonstrated the presence of the placebo effect at the time of the experiment, no study has investigated the longitudinal effect of the phenomenon. This study, therefore, attempted to answer the following question:

RQ3: Are brand-generated placebo and spillover effects a permanent phenomenon, or simply a temporary episode limited to the immediate time of exposure?

Limitations and Delimitations

This study recognized a few limitations (some of which, however, present great opportunities for future research), which can be divided into two categories: 1) sample-related limitations, and 2) theoretical foundation-related limitations. The following describes each limitation and the study's strategy to mitigate it.

Participants in this study included American boys and girls ages 9 to 13 years old. As with any study relying on children participation, obtaining school and parents' approval, as well as the willingness of the children themselves to participate in the study, can be a limiting factor. However, considering the negligible risk associated with the experiment, and the fact that the experimental activity required by participant was similar to a normal activity in a standard Physical Education class, this obstacle was not difficult to overcome.

Another potential limitation was the sample's (children 9-13 years old) ability to fully comprehend and effectively answer the pre-experiment survey questions. To

alleviate this concern, survey questions were reviewed by the participants' respective teachers, in order to ensure they met basic comprehension expected at this grade level.

Finally, it is acknowledged that ethnicity and cultural background could have a role in brand perception and performance motivation expressed by participants. Perhaps members of less materialistic cultures would react differently to brand placebos than others who are more materialistic. This study, however, did not fully investigate these variables, and will consider these important factors for future research on this topic.

While the placebo phenomenon in marketing has been receiving a lot more attention in the past decade, it is still relatively new with a limited amount of concentrated research. As such, even the most compelling findings are still open to theoretical and practical challenges, and more research is required to fully substantiate current conclusions. To address this limitation, substantiated findings and conclusions regarding the placebo effect were derived from the medical field, where the study of placebo and its effects is extensive and spreads over more than five decades.

Definition of Terms

Placebo- The term placebo is typically used in the context of pleasing. It is an element, tangible or psychological, with no essential powers or innate characteristics to produce the positive outcome it actually produces (Stewart-Williams & Podd, 2004).

Placebo effect- The outcome or reaction produced by the placebo. The placebo effect is a favorable outcome, which is largely originated from the person's belief that effective, scientific treatment has been given (Clark, Hopkins, Hawley, & Burke, 2000).

Spillover effect- The impact of external cues and consequences on individuals who are not directly or physically experiencing the cues (Kendall, 2003). In the context

of this study, the spillover impact of brand placebo on children who do not wear the brand was investigated.

Classical Conditioning/Priming- Classical conditioning (or priming) in marketing refers to the impact of prior, conscious stimuli on future behavior or performance (Irmak, 2007). While applying the conditioning stimuli is conscious, the subject's reaction or response to such stimuli is non-conscious. Pavlov's experiment with dogs in 1927, in which dogs were salivating every time they heard the sound of a bell that has been repeatedly used prior to feeding time, best illustrates the classical conditioning concept (as cited in Irmak, 2007).

Expectation- In the context of this study, expectation indicated the individual's strong belief in a desired outcome, which ultimately leads to its occurrence – a phenomenon commonly referred to as self-fulfilling-prophecy (Stewart-Williams, & Podd, 2004).

Motivation- Motivation, in the context of this study, refers to the subject's innate incentive to achieve the desired outcome (Irmak, 2007; Price & Fields, 1997). Furthermore, the subject's level of commitment to the achievement predetermined goal is believed to correspond to the success or failure of the placebo effect, i.e. the achievement of the desired outcome (Geers et al., 2005).

Brand/Branding- According to the American Marketing Association [AMA] (2013, p.1), "a brand is a customer experience represented by a collection of images and ideas; often, it refers to a symbol such as a name, logo, slogan, and design scheme."

Brand perception- Brand perception refers to consumers' mental association and opinion of a brand, based upon their personal experience or as impacted by the

company's marketing and promotional activities (positioning, advertising, public relations, packaging, sponsorships, etc.: AMA, 2013).

Marketing actions- The process of introducing, modifying or manipulating one or more elements in the marketing mix (product, price, promotion, place) in order to evaluate consumers' reaction to the introduction or modification (Shiv et al., 2005a). Examples: price reduction/increase; product features enhancement/elimination; changing advertising messages; and distribution channels modifications.

Repeated measures design- A research method in which the same subjects are used over time and under the same conditions as originally applied (Shaughnessy, 2006). This method is typically used in longitudinal studies, where the researcher's objective is to evaluate the impact of time on the study's results.

Importance of the Study

The primary goal of this study was to add another substantiating layer to the ongoing research of the placebo effect in marketing. While this study was built upon the foundations laid by previous researchers (Amar et al., 2011; Irmak, 2007; Shiv et al., 2005a; Irmak et al., 2005), it investigated additional elements that were not studied before, such as the spillover effect of brand placebo, the presence of the placebo effect when no marketing action has been introduced, and the longitudinal element in the placebo effect in marketing. In addition, this study contributes to existing research by investigating the placebo phenomenon in young children ages 10 to 13, who are considered the trend-setters and the ultimate brand builders by marketers in many industries (Smith, 2013).

Furthermore, the findings of this study may be beneficial to marketers as they devise their marketing communications strategies. Demonstrating that a strong brand perception creates a placebo effect that improves product performance and spillover effect that impacts even nonusers, may alter brand communication messages and promotional budgets. Additionally, this study highlighted the importance of brand communication versus individual product features communication, and perhaps sheds more light on the age-old question of which is more important to a company's reputation and long-term success, product or brand.

Finally, applying a repeated measures design added an important parameter to the placebo research conducted thus far. Findings related to the longitudinal attributes of the placebo effect may help marketers determine the frequency in which marketing campaigns, brand and product communications should be modified, and the impact it might have on their marketing budget.

The following chapter provides a comprehensive review of the literature associated with the placebo phenomenon and its effects. The review covers the history of the placebo phenomenon, original experimental research studies, as well as academic analyses of the placebo effect in both the medical and the marketing fields.

CHAPTER TWO: REVIEW OF THE LITERATURE

Introduction

Three main concepts were addressed in this study: branding, placebo (and the placebo effect) and the spillover effect.

The definition of brand has taken an evolutionary process. The early, company-oriented definition was introduced by the American Marketing Association [AMA] in 1960 as "a name, term, sign, symbol, or design, or a combination of them, intended to identify the goods or services of one seller or group of sellers and to differentiate them from those of competitors" (Wood, 2000, p. 664).

More modern definitions of brand and branding shift the emphasis to the customer, asserting that while companies and products attempt to lead specific brand perception and image, the actual process and outcome (i.e. actual brand perception) is truly happening in the consumer's mind. This shift ultimately led to the most recent brand definition published by the AMA, which states:

> A brand is a customer experience represented by a collection of images and ideas; often, it refers to a symbol such as a name, logo, slogan, and design scheme. Brand recognition and other reactions are created by the accumulation of experiences with the specific product or service, both directly relating to its use, and through the influence of advertising, design, and media commentary. (AMA, 2013, p. 1)

This study embraced the more consumer-oriented definition of brand, and adopted the AMA (2013) definition with the unique interpretation of Ambler (1992), who described brands as: "the promise of the bundles of attributes that someone buys and provides satisfaction… The attributes that make up a brand may be real or illusory, rational or emotional, tangible or invisible" (Wood, 2000, p. 664).

According to Evans (2003), the term placebo is typically used in the context of

pleasing. It is commonly believed that the origin of the word is found in Psalms 116:9 of the Latin Vulgate: "Placebo Domino in regione vivorum" (Moerman, 2002, p. 10), which loosely means, "I shall PLEASE the Lord in the land of living." Interestingly, researchers believe that this is a result of an inaccurate translation from the Hebrew version of Psalms, which indicates, "I shall WALK with the Lord…" (Moerman, 2002, p. 10). A medical dictionary published in 1811 adopted this taxonomy and defined the word as "an epithet given to any medicine adapted more to please than to benefit the patient" (Moerman, 2002, p. 11).

Since that reference in 1881, the understanding of placebo and its effects have developed and more importance has been applied to the phenomenon. Stewart-Williams and Podd (2004) reviewed various definitions for the word to finally conclude, "a placebo is a substance or procedure that has no inherent power to produce an effect that is sought or expected" (p. 326).

They expanded that definition to the placebo effect and posited that "a placebo effect is a genuine psychological or physiological effect, in a human or another animal, which is attributable to receiving a substance or undergoing a procedure, but is not due to the inherent powers of that substance or procedure" (Stewart-Williams & Podd, 2004, p.326). In other words, the placebo effect is a favorable outcome, which is largely originated from the person's belief that effective, scientific treatment has been given (Clark et al., 2000).

Spillover, in the context of this study, refers to the degree to which specific brand messages and attributes intended for one audience, impact the perception or behavior of another audience (Ahluwalia et al., 2001). Loewenstein, Weber, Hsee, and Welch (2001)

suggested that individuals' course of action may be influenced by emotional spillover, and emotions, such as stress, fear, or excitement may unconsciously lead the individual to an unintended decision or behavior.

This spillover effect was clearly demonstrated in a breakthrough study conducted by Fletcher (2010). The study, which included 11,373 kindergarten and 1st-grade students, found that students who shared a classroom with emotionally-challenged children scored significantly lower in math and reading tests compared with students in classrooms that did not include children with emotional problems. Moreover, the study found that exposure to girls in the classroom also resulted in a spillover effect. The higher percentage of girls in the classroom, the higher grades achieved by students in the class (Fletcher, 2010).

Theoretical Foundation

The study of mind and body and the interaction between them has captured the interest of countless researchers for centuries, and many theories have risen and fallen over time (Beedie & Foad, 2009). Technological advancements of the past few decades, such as functional magnetic resonance imaging (fMRI), have enabled a shift in research approach, which now focuses more on the unity and interdependency of the two functions. Accordingly, recent studies have validated the scientific qualities of human beliefs as triggers to physiological reactions. One such belief is the placebo effect.

This study examined the placebo effect in marketing, as well as its spillover attributes, by juxtaposing three key theories, contributing independently and in concert to the brand placebo: 1) the classical conditioning theory; 2) the expectancy theory; and 3)

the motivational theory. In addition, the study examined the possibility of a spillover effect derived from the presence of brand placebo.

Classical Conditioning

In his highly acclaimed book, *Thinking, Fast and Slow,* Nobel Laureate, Daniel Kahneman (2011) associated conditioning with our continuous effort to understand memory. Actions and emotions, he claimed, can be unconsciously manipulated by external stimuli. To illustrate this point, Kahneman (2011) cited the renowned conditioning experiment conducted by John Bargh (as cited in Kahneman, 2011), in which two groups of eighteen to twenty years old students were asked to formulate four-word sentences from a set of five words. One group was handed words related to elderly lifestyle, while the other group received words associated with younger lifestyle. Once sentence formulation was completed, students of both groups were asked to walk down the hall to another room. Astonishingly, the students who formulated sentences from elderly related words walked significantly slower than the students using "young" words, effectively demonstrating the impact of classical conditioning.

Perhaps the most notable experiment in classical conditioning was Pavlov's (1927) experiment, commonly known as Pavlov's dogs. In that experiment the dogs were salivating every time they heard the sound of a bell that has been repeatedly used prior to feeding time (Irmak, 2007). The phenomenon is explained by the fact that when unconditioned stimuli (US) is used repeatedly, it becomes a conditioned stimuli (CS), which leads to a conditioned response (CR).

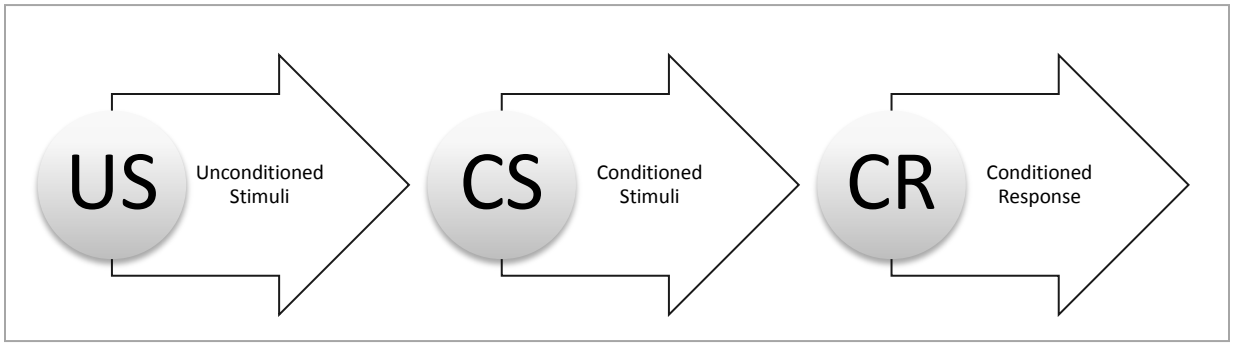

Figure 1. Classical Conditioning

Put simply in marketing terms, the brand (or product) acts as the unconditional, stimuli—the active element that unconsciously elicits a reaction—the expression of the brand through the logo, packaging, and marketing messages first creates an unconditional, weak response to the stimuli, but when repeated in high frequency, creates a conditional, predicted response, which is the placebo effect.

Irmak, Block, and Fitzsimons (2005) argued that, just like the placebo effect in the medical field, consumers' perceptions of attributes possessed by certain brands may cause the same placebo effect in marketing and literally impact their behavior. They insinuated that that phenomenon may lead to marketer manipulation by claiming brand attributes that do not really exist, but change consumers' behavior nonetheless.

In arguably the most notable research on classical conditioning, Ader and Cohen (1975) gave rats a sugar-flavored liquid with a drug that suppressed the immune system. The researchers repeated this treatment regimen a few times. Following the same treatment later with sugar-flavored liquid alone (without the active immunosuppressant drug,) the rats experienced a weakening immune system similar to that experienced with the active immunosuppressant drug (Irmak, 2007).

Classical conditioning is equally present in marketing and is manifested in various aspects of consumer behavior. Irmak (2007) used coffee consumption as an example. Individuals who drink coffee regularly, he asserted, are conditioned not only by the product they consume—caffeine—but also by the time of the day in which it is consumed, the coffee store signage, logo, and the sounds associated with the experience. Irmak (2007) further claimed that brand loyalty affects the actual experience of coffee drinkers. Consumers who are committed to a specific brand of coffee will report better taste than new customers who experience the same brand for the first time.

In fact, the conditioned stimuli (the result of the frequency in which these individuals are exposed to coffee-related incitements) is so strong that simply exposing avid coffee drinkers to the logo, package, and branding attributes of their coffee of choice resulted in an elated experience—the placebo effect—even when the actual coffee they consume is of a different brand (Stewart-Williams and Podd, 2004). This may explain the expansion strategy of Starbuck's and other chain stores: not merely territory coverage, but also consumer conditioning to increase coffee consumption.

Other researchers (Berns, 2005; Stewart-Williams & Podd, 2004) offered a different point of view on the theory of classical conditioning, and argued that conditioning is not merely a non-conscious response, rather, it does sometimes trigger conscious expectations and measurable physiological response.

Price, Milling, Kirsch, Duhh, Montgomery, and Nicholls (1999) and Benedetti, Pollo, and Colloca, (2007) supported this view and offered evidence for a expectancy-triggered conditioning response. Following a series of studies on the impact of patient

conditioning on physiological reaction to medication and placebo, they demonstrated that when patients are conditioned regarding a certain medication by physicians, trusted word-of-mouth, newspaper article, advertising or other external sources, they build a strong belief in the efficacy of that medication, which results in significantly better outcomes (Kleinman et al., 2002).

Further supporting this school of thought is Crum and Langer's (2007) study, which demonstrated that exercise contributes to health also through a placebo effect. The study included 84 female housekeeping attendants in seven different hotels. All participants were pre-tested for health measures associated with regular exercise (weight, blood pressure, waist circumference, etc.). The researchers divided participants into two groups. The first group was exposed to the conditioning information and was told that the job they perform on a daily basis is equivalent to the amount of exercise recommended by the Surgeon General for a healthy lifestyle. The second group (the control group) did not receive this information. Measuring the same health measures four weeks later (and ensuring that normal behavior did not change during that time), Crum and Langer (2007) found that the group that was conditioned to believe that their work qualifies as exercise lost more weight, and showed significant reduction in body fat, waist circumference and body mass index compared with participants in the control group.

In one of the most cited studies in conditioning, Makens (1965) offered restaurant customers two slices of turkey, indicating that one slice is from a well-known brand and the other is from an unknown brand. Customers consistently rated the taste of the well-known brand much higher than that of the unknown brand, not realizing they were eating slices from the same piece of turkey.

Olson and Dover (1978) took conditioning a step further and demonstrated its ability to drive a placebo effect. They exposed participants to faux advertising messages introducing a new coffee brand and indicating that the new brew is not bitter at all. In the experiment, however, participants were served an extra-bitter coffee. Fully framed by the pre-test information, participants indicated that the coffee was less bitter than other brands.

Taste preference, according to McClure et al., (2004), is not solely determined by our taste buds. In a neurological study using functional magnetic resonance imaging (fMRI) to compare consumers' preference between Coke and Pepsi, they found that when participants had no knowledge of which brand they taste, their preference was equally split between the two brands. However, when participants were told the brand name of the cola drinks they were about to consume (even when the information was deliberately false), participants consistently preferred Coke upon consumption, and the prior brand disclosure also activated memory-related areas of the brain, allowing the brand's cultural attributes to influence the choice. McClure et al. (2004) indicated, "there are visual images and marketing messages that have insinuated themselves into the nervous systems of humans that consume the drinks" (p. 385).

Deciding when to apply conditioning is instrumental to its effect (Wardle & Solomons, 1994). Hoch and Ha (1986) demonstrated in their JCPenney experiment that conditioning is most effective when information about the subject is shared prior to actually experiencing it. In their study, two groups of participants were exposed to an advertisement, which grossly exaggerated the quality of the examined shirt. One group saw the ad before the examination, while the other group saw the ad right after the

examination. The researchers found that the group that was exposed to the ad prior to looking at the shirt spent significantly more time touching and evaluating the shirt, and ultimately expressed far more favorable impression than the group that was exposed to the ad after the examination.

Although acknowledging Hoch and Ha's (1986) findings, Wardle and Solomons (1994) were skeptical about the impact of brand knowledge alone on the actual efficacy of the product and the tangible quality of the experience. In other words, it was clear that prior brand knowledge affected participant's evaluation of the shirt (Wardle & Solomons, 1994). However, was it simply one of many evaluating criteria (such as type of fabric and color), or was it strong enough to fundamentally impact the actual performance of the shirt overtime (durability, comfort, etc.)?

Moerman (2002) offered some insights into Wardle and Solomons' (1994) challenge, suggesting that the emotional connection (enthusiasm, sadness, fear, unmitigated belief, etc.) generated by the conditioning procedure directly impacts product's actual experience and product performance. Moerman (2002) used the changes in medical drugs' efficacy overtime to illustrate his point. He argued, based upon evidence from research, that drugs that have been very effective in the past for certain conditions, lose their clinical efficacy overtime purely due to physicians' diminishing enthusiasm and lack of conviction when presenting the drug to patients.

The phenomenon alluded to in Moerman's (2002) argument, which is referred to in the literature as the *meaning effect*, an important conditioning attribute contributing to the placebo effect. In essence, it pertains to the role of associative environmental stimuli on our behavior. The meaning effect was successfully

confirmed in Ulrich's (1984) experiment with patients recovering from surgery. The study demonstrated that patients who were placed in rooms with a window overlooking the natural surroundings recovered significantly faster than patients who did not have a window in their room.

Similarly, Moerman (2002) described four studies that demonstrated the meaning effect of colors as drivers of placebo effects. De Craen et al. (1996: as cited in Moerman, 2002) found that people predominantly perceived blue colored drugs as depressants and orange and red drugs as stimulants. Cattaneo et al. (1970: as cited in Moerman, 2002) found further that while the color blue had calming effects on Italian women, it caused insomnia with Italian men. The researchers presumed that Italian women related the color blue to the calming nature of the Virgin Mary, while it reminded Italian men of the blue jerseys worn by the Italian national soccer team and the excitement associated with it (Moerman, 2002).

A placebo effect can also be triggered by indirect conditioning methods, such as physical appearance, verbal communication and published information and rumors. According to Kirsch (2013), these "vicarious conditioning" elements affect expectations and lead to a placebo effect. Accordingly, Kirsch (2013) suggested that in a clinical setting, building therapeutic relationships between physicians and their patients would result in greater positive placebo outcomes.

A randomized patient study conducted by Kaptchuk et al., (2008) supported Kirsch's (2013) assessment. In this experiment, the impact of physician engagement and empathy towards patients on placebo treatment effectiveness was measured. Patients in the waiting room were divided to three groups. The first group had no

communication with the physician or medical staff until treatment was administered. The second group went through a standard interview with a physician. The third group went through a thorough interview and spent ample time with a physician that was attentive to their concerns. The results indicated that while the standard interview led to a better treatment outcome than complete disengagement, a significantly better outcome resulted from the enhanced, thorough physician engagement.

While it is evidently clear that classical conditioning contributes to placebo effects, many studies (Shiv et al., 2005a; Amar et al., 2011; Irmak et al., 2005) that resulted in placebo effects did not include a conditioning procedure. As a result, researchers, starting back in the 1980's, explored additional elements that accompany and complement classical conditioning in the process of creating the placebo effect (Irmak, 2007). Consequently, the response expectancy theory was introduced by Kirsch (1985). According to Kirsch's expectancy theory, a repeated stimuli (conditioning) leads to a response expectancy, which leads to a placebo response.

Response Expectancy Theory

MacInnis and de Mello (2005) defined expectations as individuals' predictions of likely outcomes based upon current circumstances. In the context of the placebo effect in medicine, individuals' strong belief in the desired (or undesired) outcome resulted in a placebo effect that deems the entire treatment effective (Irmak, 2007; Geers et al., 2005). This view was supported by Stewart-Williams and Podd's (2004) assertion that placebos are practical techniques to manipulate individuals' expectations.

Despite a wide consensus with regard to the role expectancies play in the placebo effect, researchers have not clearly mapped the cognitive process in which expectancies move to create that physiological outcome. Lundh (2000) suggested that expectancies help individuals to ease their overall stress and anxiety and, by successfully doing so, allow a better, more effective functionality of their immune system. This argument was supported by Peck and Coleman (1991), who suggested that positive expectations allow individuals to conduct normal lives, despite the severe pain they may be currently enduring. Ultimately, this changed their outlook of life and their overall demeanor, which again, according to Turner, Deyo, Loeser, Von Korff, and Fordyce (1994), distracted them from their illness, and consequently improved their overall attitude and spirit, therefore, reducing their pain.

Kirsch (2004) contended that Turner et al.'s (1994) theory pertains only to the positive placebo effect in unhealthy individuals, but is insufficient in addressing negative placebo and the placebo effect in healthy people. To mitigate the gap, Kirsch (2004) offered the response expectancy theory. According to the response expectancy theory, individuals' anticipation for a particular emotional response or experience actually

triggers a placebo effect that leads to the physiological manifestation of that experience. Kirsch (2004) argued that, in physiologically correlating behaviors (those that can be measured by changes in blood pressure, heart rate, skin conductance, etc.), expectations immediately lead to actual experience. For example, expectations to experience pain, will immediately lead to actual pain, expectations for fear will directly cause fear (Kirsch, 2004, as cited in Irmak, 2007).

Technological advancements, and in particular the introduction of the functional Magnetic Resonance Imaging (fMRI), allow researchers to make connections between observed behavior and corresponding physiological activity in the brain. Ploghaus et al. (1999) demonstrated that by manipulating patients' expectation for a stimulus they were able to affect brain activities associated with that stimulus.

In their experiment, Ploghaus et al. (1999) subjected patients to a warm or painfully hot stimulus and, using fMRI technology, monitored the activity in their brain. Prior to applying the heat, the researchers prepared patients for the type and severity of pain they were about to experience. Interestingly, monitored brain activity revealed extremely heightened activity in the brain regions responsible for pain sensation, namely the anterior cingulate cortex and anterior insula, even before actual heat stimuli were applied.

Crum and Langer (2007) supported Kirsch's response expectancy model and substantiated their argument with findings from Kaplan and Camacho's (1983) study regarding the relationships between the perception of physical activity and actual health status. In their study among 6,928 adults, Kaplan and Camacho (as cited in Crum & Langer, 2007) found that one's perceived health status was a more accurate predictor of

mortality than his or her actual health. In a similar study, Idler and Kasl (1991) established that regardless of their actual health status, elderly participants who perceived themselves in poor health were six times more likely to die than elderly participants who perceived themselves in excellent health.

To further solidify the causal relationships between expectancy and the placebo effect, Hamerman and Johar (2013) suggested, based on results from neuroimaging research, that the placebo effect is associated with the frontal and prefrontal areas of the brain, which are known to be responsible for processing expectation related functions. These functions, according to Crow, Gage, Hampson, Hart, Kimber, and Thomas (1999), can be outcome-specific expectations, or self-efficacy expectations, which is the individual's belief in his or her ability to affect the outcome.

Hamerman and Johar (2013) argued further that expectations for a positive outcome create a stronger placebo effect than vague or skeptical expectations. They supported this assertion with Buckman and Sabbagh's (1993) study of pregnant women. In the study, pregnant women who were experiencing morning sickness received what they believed to be an anti-emetic drug. Upon consumption, the women immediately reported a significant relief, which was also reflected in significantly reduced nausea related movement in their stomachs. In truth, however, the pregnant women were given an emetic—nausea-*inducing*—drug. These findings suggested that expectations can result in a placebo effect that supersedes even a pharmacological effect.

Outcome-specific placebo effect was also demonstrated in Smith and McDaniel's study (as cited in Hamerman & Johar, 2013), where patients were injected with tuberculin in both arms for six months. In one arm the tuberculin was taken from a green

vial, whereas on the other arm a saline solution disguised as tuberculin was administered from a red vial. The tuberculin from the green vial caused inflammation on patients' arms. The saline used from the red vial on the other arm showed no inflammation. The researchers then secretly reversed the contents of the vials: red vial now containing the tuberculin and the green vial the saline solution. This time, however, the actual tuberculin administered from the red vial caused significantly less inflammation, leading the researchers to believe that patients' immune system was actually manipulated by their expectation that the content of the red vial caused no inflammation (Hamerman & Johar, 2013).

Inspired by the prevalence of the placebo effect in medicine, psychologists and marketers began investigating the placebo effect in consumerism and buying behaviors. Shiv et al. (2005a) investigated the placebo effect of marketing actions and found linear correlation between the product's price and individuals' perception of its quality and ultimate performance. They demonstrated in their study that the more people pay for energy drinks that promise an increase in overall alertness, the more attentive and vigilant they would become. When participants became aware that the only difference between the drinks in the study was the price, the overall effect of the drink was subsequently weakened, clearly reflecting a placebo response in the first study.

To further substantiate the validity of the placebo effect, Wagner (2005) utilized the fMRI technology to examine participants' brain activity as they tasted, what they perceived to be, different wines. The results reflected an astounding phenomenon: sequentially tasting from different glasses containing the exact same wine resulted in significantly greater brain activity around the orbitofrontal cortex, the pleasure center of

the brain, when participants were told the wine they were consuming costs $90 per bottle. However, brain activity in the orbitofrontal cortex subsided significantly when the wine was priced at $10 per bottle. These results indicated that participants enjoyed the wine more when they perceived it to be more expensive. Wagner (2005) concluded that the placebo effect actually modifies brain chemistry, changing pain and pleasure levels by manipulating individual's expectations.

According to the model established by Shiv et al. (2005a), product efficacy is directly affected by general beliefs (such as the relationships between price and quality) and marketing messages (such as advertising). Both aspects create strong expectancy levels with regard to the product's performance (responses expectation), which ultimately led to the enhanced performance outcomes participants actually experienced (Irmak, 2007).

Ewald and Moskowitz (2007) applied Shiv et al.'s model and suggested that the brand, as the external attribute of the product it represents, frames consumers' expectations for the product's performance. The placebo effect is, therefore, the outcome of the unique, positive, reassuring and trustworthy feelings projected by the brand, which ultimately become specific beliefs in the consumer's mind (Irmak, 2007).

These types of emotional reactions are created, not only by brand's visual attributes, but also by its linguistic aspects. Schonauer (1994) investigated the effect of drug names with students and doctors and concluded that both the phonetic and semantic attributes of the name affect its perceived clinical efficacy. Vallance (2006) used the drug Viagra to explain these effects:

> To illustrate with 'Viagra', one can suggest that its juxtaposition of hard-sounding syllables with the letter 'a' (phonetic quality) and its similarity with words such as

> 'vigor' and 'Niagara' (semantic quality) may act to enhance its meaning for an individual with impotency. (p. 290)

According to Berns (2005), for a sentient placebo to occur, three cognitive operations must take place: 1) communication of information relevant to the specific phenomenon; 2) ensuring the information is retained in the subject's memory; and 3) the subject's expectation that the information will actually impact the experience. Interestingly, the first two conditions occur consciously, leading to the third condition that occurs subconsciously, effectively acting as conditioning methods leading to the subconscious, Pavlovian placebo response.

To substantiate his theory, Berns (2005) employed brain research conducted by Montague and Berns (2002) directly associating between the release of dopamine from the subcortical region of the brain to creating the linear relationships between expectations and actions. For example, when a person is introduced to a new and desirable item, a high level of dopamine is immediately released. External stimuli, such as advertising, aims to retain that level of dopamine and thereby the original excitement about the new item, which ultimately leads to desired outcomes (Berns, 2005).

Applying this theory to Shiv et al.'s (2005a) research regarding the relationships between price and quality, one may assert that price is, in this case, the known stimuli. This is perpetuated by frequent branding and advertising messages continually associating high price with high quality, thus, generating expectations through a placebo effect that lead to the desired outcome – increased alertness and focus (Berns, 2005).

Similarly, Waber, Shiv, Carmon and Ariely (2008) found in their research with placebo painkillers that a higher priced placebo was more effective in reducing pain than a lower priced one. Waber et al. (2008) conducted their experiment with 82 healthy

participants. Each participant received a brochure, introducing them to a new painkiller, similar to codeine, but with significantly faster response time.

The new painkiller was actually a placebo pill. The researchers told half of the group that the price of the pill was $2.50, while the other half of the groups was told that the pill cost $0.10. After pain application, participants of both groups were given the placebo painkiller as a treatment. The results showed that participants who believed the pill cost $2.50 experienced significantly faster relief than participants who believed the pill cost $0.10. Waber et al. (2008) concluded that the price manipulated participants' expectation about the efficacy of the painkiller and created a placebo effect of the (sham) drug's performance.

Alongside the ample research and conclusive findings mentioned here regarding the role of expectancy increasing a placebo effect, some studies suggested that expectation, or expectation alone, may not lead to a placebo effect. Irmak et al. (2005) repeated Shiv et al.'s (2005a) research in the placebo effect of marketing using the energy drinks experiment, but found in their similar experiment with 106 undergraduate students, that the placebo effect was experienced only by participants who expressed a high level of motivation to experience the desired outcome (energy boost, higher alertness, etc.). Participants that did not display that level of desire did not experience the same placebo effect, leading the researchers to conclude that motivation is another important ingredient in the placebo effect process.

Motivation

According to Irmak (2007), individuals' innate desire for a medical treatment to be effective, or for a product to perform well, plays a significant role in creating a

placebo effect that is consistent with that desire. This phenomenon is apparent in the medical field where ample empirical evidence suggests that patients' natural motivation for a painkiller to be effective in reducing their pain leads to significantly improved efficacy of that painkiller (Price, Chung, & Robinson, 2005).

This phenomenon also exists in the marketing field. Irmak et al. (2005) replicated Shiv et al.'s (2005a) study, which demonstrated that individuals' perceptions regarding the relationships between price and quality of energy drinks leads to a placebo response affecting the actual performance of the drinks. In their follow up research, Irmak et al.(2005) added a pre-test survey, which evaluated participants' desire for the energy drinks to deliver the qualities promised by the packaging. The subsequent study results demonstrated that while the placebo energy drink positively affected participants' cognitive alertness and overall exuberance, these attributes were only apparent in participants who expressed high motivation in the pre-test survey.

Geers et al. (2005) posited that while expectations are a necessary ingredient in the placebo effect, it is ultimately the individual's motivation and aspiring goals that determine the tangible manifestation of the placebo effect. Geers et al. (2005) conducted a series of five studies with 119 undergraduate students, investigating the overarching hypothesis that a significant placebo effect will be generated only when participants' expectations and motivations (or goals) for the desired outcome are in sync. In each of the five studies, participants were exposed to a different motivation-priming element.

The results fully supported Geer et al.'s (2005) hypothesis: when participants' expectation for an outcome was primed with a corresponding goal to realize that outcome, a strong placebo effect was produced. When the researchers primed

participants with a goal that did not correspond to their placebo expectation, however, no placebo effect occurred. Finally, the results demonstrated that when participants' expectations failed to generate a placebo effect, the corresponding motivation generated by the participants (under priming) was able to create the placebo effect. Geers et al. (2005) concluded, therefore, that motivation amplifies expectation, which then leads to a placebo effect.

Based upon Geers et al.'s (2005) findings, Irmak (2007) suggested that since individuals' motivation leads to a placebo effect, they could deliberately modify and manipulate their behavior to ensure that a placebo effect is generated. Russell (2003) contended that physical and cognitive feelings can many times be vague, misdirected and subject to change. However, when a relevant, conforming goal is introduced, these feelings operate within the goal's context and are modified to yield the desired, tangible experience.

Geers et al. (2005) argued further that goals point individuals to realize a specific placebo outcome, rather than an impact on general feelings or attitudes. Kunda and Spencer (2003) strengthened this argument and added that without a clearly defined goal and the motivation to reach it, individual's expectations will ultimately be forgotten or ignored, leaving no cognitive impact that could lead to a placebo effect.

Price and Barrel (1984) were among the pioneers who established the importance of motivation and desire as drivers of placebo and non-placebo outcomes. Unlike Geers et al. (2005) and Kunda and Spencer (2003), they asserted that motivation and expectation are rarely separable, and together lead to 'hope,' which according to Harrington (1999), "…doesn't mean that we think things will come out okay, it means

that we think things will somehow make sense" (p. 291).

In the context of the placebo effect in medicine, this combination of expectation and desire (or motivation) amounts to individuals' belief that it would make sense for the medication to be effective in improving their condition, which ultimately leads to a placebo effect that delivers just that. Similarly, in the marketing field, individuals apply innate desire and expectation that higher priced products, or prestigious brands will perform better than lower priced, less prestigious ones. In their mind, it should simply make sense. And, the resulting placebo effect makes it so.

Academic literature regarding the aspect of motivation in the context of the placebo effect reflects two schools of thought. The first school of thought holds the more prominent philosophy that defines motivation as the individual's desire to improve current state (of self or product: Price & Field 1997; Stewart-Williams & Podd, 2004). These researchers contended that considering the many instances in which the placebo effect is negative (the nocebo effect), the notion that motivation plays a role in the placebo process in incomprehensible (Irmak, 2007).

The second school of thought (Geers et al., 2005; Irmak, 2007) holds that motivation should be defined in much broader terms than simply a desire to improve current condition. They embrace Gollwitzer and Moskovitz's (1996, as cited in Irmak 2007) theory of micro (proximal) level goals and macro (distal) level goals. Micro level goals relate to specific tasks individuals would like to see accomplished. At the micro level, there is little room for goal adjustment or redirection. The macro level goals, however, are broader and more directional. They guide individuals towards a desired destination, but are flexible enough for maneuvering should a specific (micro) goal

appear unachievable, or is when the individual is faced with unexpected challenges. Therefore, according to Irmak (2007), macro goals adjust in cases of negative placebo effect (nocebo effect) without negating the original motivation for a positive outcome.

An earlier study by Jensen and Karoly (1991) administered a placebo sedative drug on participating patients, while telling them that the drug was more effective with individuals who show either positive or negative personality traits. By manipulating participants' motivation, the researchers demonstrated that the placebo effect is generated in cases where participants expressed high motivation, notwithstanding any level of expectation.

Irmak (2007) built upon the findings of Jensen and Karoly (1991), Geer et al. (2005), and Shiv et al. (2005) and investigated further the singular impact of motivation on the placebo effect. In his study regarding the placebo effect of energy drinks, Irmak (2007) conducted an experiment with 106 undergraduate students who were randomly divided into three groups.

The first group was given an actual energy drink; the second group was given a placebo energy drink (a decaffeinated drink with identical taste of the real energy drink); the third, control group, was given only water. An empty can of the energy drink, boasting its logo and branding messages was placed in each of the two test rooms. Participants' blood pressure, overall arousal, mental alertness, and physical reflexes were tested prior to drink consumption. Still prior to commencing with the experiment, participants were asked to read fabricated promotional information regarding the energy drink, and answer questions regarding their motivation for the drink to work, and their expectation that it actually would.

Upon consumption of the energy and placebo drinks respectively, participants

in each group were measured again for all four measures mentioned earlier. The results showed a significant increase on all measures (blood pressure, overall arousal, physical reflexes, and mental alertness) in participants' who drank the placebo energy drink and expressed high motivation in the pre-test. Conversely, expectations expressed in the pre-test showed no impact whatsoever on the placebo effect experienced by participants. These unequivocal findings led Irmak (2007) to conclude "motivation, but not expectations is influential in creating a placebo effect when consumers were presented with high-efficacy information about the consumed product" (p. 36).

A more recent report by Price, Finniss, and Benedetti (2008) defined motivation as individuals' desire for a particular outcome to occur, or their desire that it does not occur. Therefore, Price et al. (2008) suggested that in order to achieve a powerful placebo effect, both motivation and expectation must be present.

In Shiv et al.'s (2005a) experiment with the placebo effect of price manipulation, the higher the price participants paid for the energy drink, the more alert and invigorated they felt. When participants were informed about the price manipulation of the drinks, however, the placebo effect was significantly weaker. Shiv et al. (2005a) attributed the placebo effect demonstrated in their study solely to expectancy theory, asserting that participants' expectation that a higher-priced product will perform better than a lower-priced product.

Motivation theorists (Geers, 2005; Irmak et al., 2005; Irmak, 2007; Price et al., 2008), however, have suggested that motivation was actually an essential contributor to the placebo effect found in Shiv et al.'s (2005a) experiment. They argued that participants (and consumers in general) carry an innate motivation to justify paying a

higher price for a product, and better performance is the natural manifestation of that desire.

Schmitt (2012) charted the psychology of consumers' relationships with brands (Figure 2) and suggested that consumers develop an affinity to a brand when they can personally identify with it.

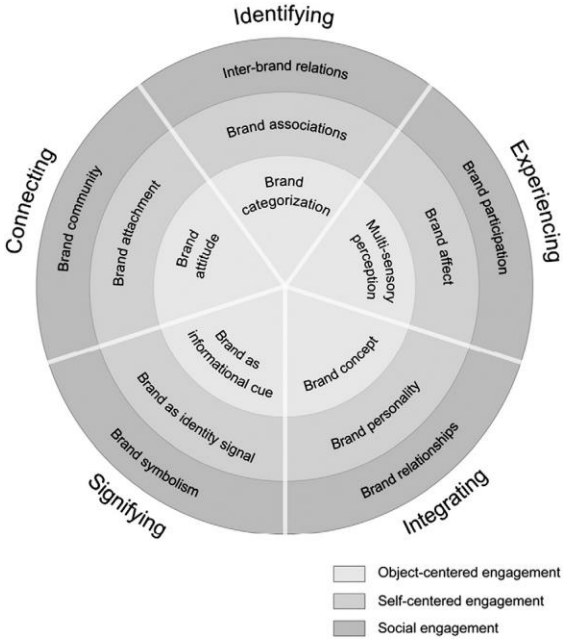

Figure 2. Consumer psychology model of brands (Schmitt, 2012)

Hogg, Cox, and Keeling (2000) added that there is a harmonious relationship between the consumer's self-image and behavior and the product or brand image. According to Hogg et al.'s (2000) theory, the closer and more harmonious the relationship between the consumer's self-image and the brand image, the more likely he or she would be to purchase the product.

In a similar manner, Punj and Hillyer (2004) suggested that an affinity to a brand can create expectation and motivation for successful performance that leads to a placebo effect. This concept is based upon the self-expansion theory (Reimann, Castaño, Zaichkowsky, & Bechara, 2012), which holds that the basic human desire is to grow intellectually, emotionally, financially, and more, through the acquisition of close and trusted relationships.

Reimann, Casta Castaño, Zaichkowsky, & Bechara, (2012) argued that the self-expansion theory also applies to the relationships consumers build with brands. When consumers first develop an affinity for a brand, they experience an emotional arousal and an identity lift (feelings of increased social status, ego boost, etc.) that results in an increased motivation to maintain these elated feelings and, therefore, a placebo brand performance ensues.

The Placebo Effect in Sports Competition

While the placebo effect in sports has not been studied to the extent that as it has been in medicine, the experiments conducted with athletes in various sports confirm the overall conclusion that the placebo effect is a product of the interaction between conditioning, expectations and motivation (Beedie & Foad, 2009).

Ariel and Saville (1972) were the pioneers of placebo research in sports. In their acclaimed and highly cited experiment, they recruited fifteen avid weightlifters to study the impact of anabolic steroids on their performance. Prior to conducting the experiment, the researchers collected participants' performance data in four weightlifting exercises: bench press, military press, seated press, and squat. Participants were primed by receiving information regarding the drug they would be taking in the study and the

positive impact it would have on their performance. During the actual experiment, six participants received a placebo anabolic and their strength data was collected in two phases. In the first four-week *pre-placebo* phase, no drugs were administered, and then, in the second four-week *placebo* phase, participants were given the placebo pills.

The results showed a significant increase in participant's weightlifting performance (compared with baseline data) in both phases of the study, but particularly in the placebo phase, where participants believed they were taking a performance enhancing anabolic steroid. Bench press performance was improved by 9.6%, military press by 8.5%, seated press by 6.2%, and squats by 13.8%. This significant increase in performance in all four exercises is particularly surprising since participants were experienced and highly trained weightlifters. Ariel and Saville (1972) concluded that the high expectations for improved performance increased participants' motivation, which led to the placebo response they experienced.

The next empirical study regarding sports performance was conducted only 28 years later. Maganaris, Collins, & Sharp (2000) replicated Ariel and Saville's (1972) experiment and hypothesized: 1) the placebo anabolic steroid would significantly improve participants' performance; 2) if the sham is disclosed, participants' performance would recede back to baseline levels. Eleven experienced weightlifters were given a placebo pill, believing it was a true anabolic steroid. The placebo drug was administered weekly, resulting in significant performance improvement in all tested exercises. After the first test, researchers disclosed the sham to six participants, and then repeated the experiment.

Results of the second experiment showed that while the performance of participants who still believed they were taking real steroids continued to improve, the performance of the six participants who were aware they were taking a placebo pill receded to baseline levels. Maganaris et al. (2000) concluded that expectation and motivation created both a positive placebo effect (improving performance of uniformed participants) and a negative placebo effect (reducing performance of informed participants).

Changing course from weightlifting to the running tracks, Foster, Felker, Pocari, Mikat, and Seebach (2004) demonstrated the placebo effect of false ergogenic water on runners' performance. Sixteen avid runners participated in the experiment. Prior to conducting the test, participants were primed with a video promoting a new ergogenic drink with unique performance-enhancing qualities.

Following the conditioning treatment, participants were given normal water, and water falsely presented to contain ergogenic boost. Subsequently, participants were asked to conduct a 5km run. The results clearly demonstrated the placebo effect with significant performance improvement (total time, lap time, heart rate, blood lactate) among participants who believed they were consuming ergogenic water. Foster et al. (2004) found further that most significant improvement in performance among runners who believed they had consumed the ergogenic water occurred in the final 400m of the course.

Foster et al.'s (2004) findings contrasted with Wilmert, Porcari, and Foster (2002) who found no effect of super-oxygenated water and placebo water. Porcari and Foster (2006) replicated Wilmert et al.'s (2002) experiment, only this time adding a conditioning

treatment prior to the test. Thirty-two avid runners participated in the study. Prior to the running test, the researchers showed runners a video highlighting the unique benefits and impact of super-oxygenated water on runners' performance.

Following the presentation, participants consumed either regular bottled water, which was genuinely presented as such, or water that was falsely purported as super-oxygenated. Porcari and Foster (2006) measured participants' total time, heart rate, and blood lactate before the experiment and then during the experiment's three 5km time trials. While no significant differences were found in participant's heart rates and blood lactate, the study results demonstrated a significant performance improvement (close to a 3-minute difference) among runners who believed they had consumed super-oxygenated water.

Beedie, Stuart, Coleman, and Foad (2006) added another measuring element to previous studies, and investigated whether different dosages of placebo caffeine would result in different placebo effects. In their experiment, seven competitive cyclists were informed that they would be conducting three different cycling tests. Participants were additionally informed that in the first test they would get a placebo capsule, in the second test a capsule containing 4.5mg of caffeine, and in the third test a capsule containing 9.0mg of caffeine. In truth, however, all capsules in the study contained a placebo substance.

Prior to conducting the test, participants were primed by promotional literature and videos highlighting the performance-enhancement qualities of the caffeine, including convincing testimonials from well-known cyclists. Beedie et al. (2006) found that when participants believed that a placebo was administered, their performance declined below

the measured baseline (negative placebo effect). When they believed, however, that they have had caffeine, their performance was significantly improved. Furthermore, the results demonstrated an incremental increase in performance between the two dosages. When participants believed they had consumed a 4.5mg of caffeine, their overall performance improved by 1.3%, and when they believed they consumed the 9.0mg capsule, their performance improved by 3.1%.

The negative placebo effect (nocebo) demonstrated in the study when participants believed they were taking a placebo pill inspired Beedie, Coleman, and Foad (2007) to investigate whether different attitudes towards the placebo caffeine would result in a different placebo response. In other words, would participants who demonstrated positive attitude towards the placebo perform better than participants who expressed a negative attitude?

Beedie et al. (2007) recruited 42 experienced athletes that were randomly divided into two groups—the positive group and the negative group. Both groups were informed that they would be running a 30m sprint. Additionally, the runners were told that, prior to the experiment, they would be consuming an ergogenic drink. The drink included a placebo substance purported to be ergogenic. In order to establish a baseline, the two groups performed three 30m sprints, after which they were given the placebo substance.

At this stage, Beedie et al. (2007) provided each of the groups with different information regarding the placebo. The positive group received information boasting the positive performance-enhancement qualities of the substance, while the negative group received information regarding the negative impact the substance is known to have on

running performance. Subsequently, the groups were asked to repeat the 3X30m sprint run.

The results indicated that in the pre-test, baseline trials participants' performance declined between each interval (measured by the mean speed per trial). In the experimental trials, however, the negative belief group continued to show decline in speed performance, while the positive belief group demonstrated a significant improvement in performance between the intervals. Beedie et al. (2007) concluded that conditioning and expectations played a significant role in creating a placebo and nocebo effect on performance.

Inspired by the work of Maganaris et al. (2000), Kalasountas, Reed, and Fitzpatrick (2007) conducted a similar study with weightlifters, applying the same hypotheses: 1) participants who consumed placebo ergogenic would experience performance improvement; and 2) informing participants that they have been consuming a placebo ergogenic would cause their performance to diminish to baseline levels.

Kalasountas et al. (2007) divided 42 participants into three groups—one control group and two test groups—14 participants in each group. Each of the test groups underwent two experimental trials. The first test group was administered placebo ergogenic in both trials, while the second test group received placebo ergogenic in the first trial and no placebo intervention in the second trial. Subsequently, the researchers commenced with a series of five trials, three control trials with no intervention, in order to establish a baseline, and two experimental trials.

In both cases, participants were asked to perform bench press and leg press exercises and the researchers measured resistance all the way through muscle failure.

Prior to starting the experimental trials, participants in both groups were given a placebo substance staged as a form of amino acids, which is known to immediately improve strength and endurance. Two additional capsules were given to participants in both experimental groups about 10-minutes after they started the trial. In the second experimental trial, the first group continued to receive the placebo, while the second group was informed about the negative impact of the capsule's substance and, therefore, were not administered the substance.

The study results revealed a direct impact of participants' expectations on the occurrence and strength of the placebo effect. In the first experiment, where participants of both groups believed they were consuming an amino-acid substance, significant performance improvement was detected compared to baseline levels. In the second experiment, however, revealing the deception to the second group caused performance levels to drop back to the baseline levels. Kalasountas et al. (2007) conducted post-experiment interviews with participants and found that, on average, 60% of all participants expressed positive expectations, assuming that they had consumed a true amino-acid capsule. In addition, an average of 65% of participants reported an overall elevation in energy and vitality levels after consuming the placebo substance.

As indicated earlier, the research of the placebo effect in competitive sports lags far behind the placebo research in medicine. Furthermore, the studies summarized here reflect a consistent theme among researchers, one that focuses on the placebo substance effect on performance. In each of the studies, a placebo substance, such as caffeine, super-oxygenated water, or amino acids was administered and its impact on performance was measured. Research on the impact of brands on sports performance, and the

performance spillover effects caused by the placebo intervention, are reviewed in the following section.

The Spillover effect

Spillover, in the context of this study, refers to the degree to which specific brand messages and attributes intended for one audience impact the perception or behavior of another audience (Ahluwalia et al., 2001). Loewenstein et al. (2001) suggested that individuals' course of action may be influenced by emotional spillover, and emotions, such as stress, fear, or excitement may unconsciously lead the individual to an unintended decision or behavior.

This spillover effect was clearly demonstrated in a breakthrough study conducted by Fletcher (2010). The study, which included 11,373 kindergarten and 1st-grade students, found that students who shared a classroom with emotionally-challenged children scored significantly lower in math and reading tests compared with students in classrooms that did not include children with emotional problems. Moreover, the study found that exposure to girls in the classroom also resulted in a spillover effect. The higher percentage of girls in the classroom the higher grades achieved by students in the class (Fletcher, 2010).

Burke and Sass (2008) supported Fletcher's (2010) findings. In a quasi-experimental study, they investigated the potential performance spillover effect among students, grades 3 to 10, in Florida public schools. To that end, the authors reviewed students' performance in math and reading over a five-year period (1999 to 2003). The authors divided their review in three main groups: elementary schools, middle schools

and high schools. In each of the tests and observations, they changed the class mix between high-rank, middle-rank and low-rank students.

Burke and Sass' (2008) investigation revealed a significant spillover effect between high-rank and low-rank students in the same class. Specifically, in all three levels of schooling (elementary, middle and high school) results showed that the lowest-ranked students improved their math and reading scores by almost an entire grade level when more highly ranked students are added to the class. Middle-ranked students also showed a significant increase in their grades when more highly ranked students were added, although their gain was not as high.

When the class mix represented a greater percentage of low-ranked students, the results showed a negative spillover effect, whereby highly ranked students experienced a significant decline in their math and reading scores. Similar results appeared in the middle school and high school evaluations. A final and clear confirmation for the spillover effect was demonstrated when the class mix included a significantly larger number of middle-ranked students. The net spillover effect in this case was close to zero (Burke & Sass, 2008).

Ohinata and van Ours (2012) found similar impact in their study of immigrant children's effect on native Dutch students' achievement in language, math, and reading. The dataset for the research was PRIMA, a public database commissioned and distributed by the Ministry of Education, which included longitudinal information from about 600 schools throughout the Netherlands. Additional demographics and lifestyle information was collected directly from students, parents and teachers. Ohinata and van Ours (2012) focused their investigation on 2nd through 8th grade students.

The results' pattern demonstrated by Ohinata and van Ours' (2012) study, was virtually identical to those presented by Fletcher (2010) and Burke and Sass (2008). Native Dutch students, particularly those in the lower socioeconomic bracket, were seriously affected by the inclusion of immigrant students in their classrooms. The results further indicated that the lower socioeconomic class of the immigrants, the greater the negative spillover effect on the academic achievement of native Dutch students. Finally, the study demonstrated that first generation immigrants had a larger negative spillover effect than second generation immigrants that have had more time to assimilate and immerse with the Dutch culture (Ohinata & van Ours, 2012).

Team sports appear to be a ripe field for spillover investigation. Kendall (2003) evaluated the effect of highly talented basketball players on their teammates' performance. Kendall (2003) reviewed performance statistics of all National Basketball Association's (NBA) teams between 1989 and 2000. His investigation revealed that, at any given time, when a team included a 'super star' player, the offensive performance (total points, successful shooting percentage, number of assists) of each other player in the team improved considerably. Of similar significance is the fact that the spillover did not appear to affect players' free shot statistics. Kendall (2003) explained that during a free shot, each player stands in front of the basket individually, therefore teammates' performance spillover is minimal.

Kendall (2003) concluded that the spillover effect found in basketball is not likely to occur in baseball, which despite being recognized as a team sport, actual performance (pitching and batting) is evaluated individually. This conclusion is supported by the foundational findings of Scully (1974) and his assertion that a baseball team's

performance is no more than the sum of the individual performances of each of its team players. Gould and Winter (2009) also echoed this view and argued, "the game of baseball presents an ideal case where the performance of each player is easily measured in a uniform way, and in complete isolation from the performance of his teammates" (Gould & Winter, 2009, p. 191).

Papps (2008)offered a contradictory conclusion, supported by empirical results. Papps (2008) reviewed Earned Run Average (ERA) and batting average (BA) data from 1953 to 2003 and conducted a regression analysis, which unequivocally demonstrated that individual (pitcher and batter) performance was significantly influenced by spillover teammates' performance. "Pitchers post lower ERAs if other pitchers on their team played well in the same season or in the previous season; batters achieve higher averages if their batting colleagues perform well in the current season" (Papps, 2008, p. 18).

Bradbury and Drinen (2008) supported Papps (2008) and disproved the common baseball fans' wisdom of 'protection', the belief that a good batter improves the hit probability of the player currently batting, and similarly, a bad player will negatively affect his batting teammate. This common spillover belief stems from fans' knowledge of the game, and their considerations of the opposing pitching strategy. Bradbury and Drinen (2008)presented a contradicting argument. Reviewing sequential batting performance of Major League Baseball (MLB) players, they found a negative correlation between the skill level of the on-deck hitter (the player following the current batter) and the hitting performance of the preceding batter. Namely, the better the on-deck batter was, the worse the performance of the current batter would be. This spillover effect, according to Bradbury and Drinen, is two-fold. It not only affects the performance of the

hitting teammate, but also the strategic calculations of the pitching opponent, and thereby his ultimate performance.

Hong (2011) investigated the spillover effect of veteran baseball players on their teammates. Focusing on players' experience, rather than their skill level, Hong (2011) conducted an analysis of the average number of years played by each team member. A regression analysis controlling for all variables with potential influence (teammates skill levels, position played, etc.) suggested a clear positive correlation between the average experience of teammates and the performance of the individual player.

Similar spillover effects were found by Rossman, Esparza and Bonacich (2010) who investigated the impact of highly acclaimed, Oscar winning film professionals on the performance and likelihood of Oscar nomination, of other actors with whom they collaborated in a film. Rossman et al. (2010) presented two hypothesis: 1) Outranking a highly acclaimed actor (in the caliber of Robert De Niro, or Meryl Streep) in a film (appearing before them on the film credit roll) significantly increased the actor's chances to be nominated for an Oscar; and 2) The skill level and experience of top actors in a film would spillover to their less acclaimed co-starts, improve their performance and increase their likelihood to become Oscar nominees.

Rossman et al. (2010) created a database of the top ten credited roles between 1936 and 2005. The data contained 147,908 performances by 37,183 actors in 16,392 films. Based on this robust database, the researchers developed an Oscar nomination predictive model. The data satisfied their first hypothesis by revealing that actors with similar experience had different chances of being nominated based upon the caliber of stars with whom they have collaborated. This reflected a strong spillover effect of star

power from the acclaimed actors to their less acclaimed co-stars. Further, the data supported Rossman et al.'s (2010) second hypothesis, revealing that collaborating with highly respected and previous Oscar winning talent increased relatively unknown actors' chances to be nominated by as much as 35%. This, again, clearly demonstrates the power of the spillover effect.

Mas and Moretti (2009) offered yet another dimension to the study of spillover effect, how and why the productivity of one worker affects the productivity of another worker in a group setting. In their seminal experiment, Mas and Moretti (2009) focused on the productivity effect of cashiers at a supermarket and investigated how the introduction of highly productive cashiers affected the productivity of other cashiers in the same shift. The experiment demonstrated that the insertion of highest performing cashiers and placing them in locations that are clearly visible to all other cashiers, caused a significant increase in the productivity of the other cashiers.

For over two-years, Mas and Moretti (2009) collected data regarding the number of items scanned by each cashier per transaction, and the exact amount of time spent by the cashier on each transaction. Accordingly, the researchers' defined productivity for each cashier as the number of items scanned per second. Study results demonstrated a very strong productivity spillover effect. They found clear indications that when replacing a low productivity cashier with a highly productive one, this led to an average of 1% improvement in the productivity of every other cashier in the same shift.

Results further demonstrated that the impact of the spillover effect was largely contingent upon the skill level of the cashiers in the shift. Cashiers with low productive measures exhibited significantly greater improvement as a result of the new mix of

cashiers than high-productivity cashiers. In fact, while the productivity of low-productivity cashier increased dramatically due to the introduction of a highly productive cashier to the shift, the overall productivity of high-productive cashiers did not change (Mas & Moretti, 2009).

Mas and Moretti (2009) suggested that three key factors contribute to the spillover effect demonstrated in their experiment: 1) social pressure—a slower cashier causes her peers to work harder and therefore may not be perceived well by her coworkers; 2) pro-social preferences—a cashier's display of increasing competitive spirit, or alternatively, trying to avoid the guilt feeling associated with being less productive in a highly productive environment; and 3) knowledge spillover—a highly skilled cashier either consciously transmits information to a lower skills' coworker, or subconsciously inspires coworkers to acquire and display knowledge.

Following Mas and Moretti's (2009) foundational conclusion, Arcidiacono, Kinsler, and Price (2013) developed a predictive model estimating the relative contribution of a highly productive NBA player on the overall productivity of the team, and the productivity of each teammate during the 2006-2009 seasons. Applying the model on publically available data regarding number of games played, number of shots taken, number of turnovers, rebounds, and fouls, Arcidiacono et al. (2013) found that the presence of a highly skilled player in the team positively impacted the productivity of other players in the team—especially teammates in lower productivity brackets.

According to Guryan, Kroft, and Notowidigdo (2009), the investigation into the question of performance spillover effect dates back to 1898, where Norman Triplet's (as cited in Guryan et al., 2009) set of experiments indicated that cyclists performed

significantly better when competing against one another than when racing individually against time. Conversely, Allport (1924, as cited in Guryan et al., 2009) found that performing in a group hinders one's performance. In his study, Allport (as cited in Guryan et al., 2009) demonstrated that in writing debate letters, participants made significantly fewer mistakes when working alone versus working in the company of others.

Falk and Ichino (2006) were the first to study productivity spillovers in a laboratory (versus field) setting. The research investigated the spillover effect of one worker's productivity on the performance of another worker who is present in the same room and conducting an identical task—stuffing letters into envelopes. The study found that a 10% increase in one worker's productivity led to a 1.4% increase in his coworker's productivity. Falk and Ichino (2006) concluded, based on these results that, while moderate, the spillover effect was evident.

Bandiera, Barankay, and Rasul (2009) built upon the findings of Falk and Ichino (2006) and other researchers, but added a new factor to the productivity spillover equation: the worker's peer identity. In their experiment with soft fruit pickers, the authors found that the relationships between the individuals working next to each other impacted the presence and degree of the productivity spillover effect. Bandiera et al. (2009) argued that a high-performing worker will become less productive when working next to a low-performing friend, while a low-performing worker will be more productive when working next to a high-performing friend. In both cases, the authors found the results independent of the friend's skill level. Furthermore, the authors asserted that these results held even in settings in which workers are paid by the hour—ostensibly, an

incentive to slow down—reflecting a conscious choice to obey a social value rather than enjoying greater compensation.

Contrary to Bandeira et al. (2009), Falk and Ichino (2006), and Mas and Moretti (2009), to name a few, Guryan et al. (2009) found no evidence to suggest that any individual performance or productivity affects another. Collecting and analyzing performance data of professional golfers for the years 1996 through 2006, Guryan et al. (2009) found that a golfer's ability or performance had no influence or spillover effect over his playing partner.

According to Whitmore (2005), class size and the class gender mix affects students' achievements through a spillover effect. She based her conclusion on findings from experiments conducted by the Tennessee STAR project, which included 79 schools and 11,600 students. One of these experiments tested the impact of class size on students' achievement. One group of children was randomly assigned to small classes (13 to 17 students) from kindergarten to third grade, and then at fourth grade, they were returned to regular size classes (22 to 25 students).

The results of this experiment demonstrated a dramatic increase in test scores among small class students during kindergarten, an effect that endured through high school. Whitmore (2005) found further that the test score increase did not merely reflect the class size, but also the mix of behaviors displayed in the classroom. She pointed out that the largest percent increase in test scores was demonstrated among the more poorly behaved students, indicating a spillover effect created by the well-behaved ones.

Whitmore (2005) presented yet another important finding regarding the spillover effect of gender mix in the classroom. Based upon the same data from Tennessee's

STAR project, she demonstrated that students assigned to classes with more than 50% girls in the classroom, experienced an average increase of 2.3 percentile points in their test scores.

The spillover effect was also investigated in psychology and medicine. Rudman and Bordiga (1995) found in a series of experiments that when people were exposed to an overly sexualized woman, they would rate her as less intelligent and with poor morality. More importantly, they found, particularly with men, that this perception had a spillover effect to their rating of women who were modestly dressed. In one experiment, Rudman and Bordiga (1995) randomly exposed men to images of minimally dressed women, who immediately rated women that were physically present in the study. The men rated the women as less intelligent and moral, despite the fact that they were all conservatively dressed.

Winickoff , Coltin, Morgan, Buxbaum, and Barnett (1984) identified a spillover effect in a study regarding physicians' performance in increasing patients' compliance with colorectal cancer screening, which required an annual digital examination and test for occult blood. Following failed attempts to improve compliance in a period of 3½ years, the researchers provided one group of physician (the test group) with feedback regarding their performance ranked against that of their peers. The second group received no feedback and acted as a control group. Within the first six months since feedback and ranking were provided, the test group's performance improved from 66% to 79%. Surprisingly, the control group's performance improved as well, from 67.5% to 76.6%, reflecting a significant spillover effect.

Freedman, Kearney, and Lederman (2010) examined the presence of spillover

effect in consumerism. They investigated how information about the quality of a defined set of products affected consumers' judgment and selection of other products. Looking at comprehensive sales data of infants and toddlers' toys for 2005 through 2007, Freedman et al. (2010) focused on changes in consumers' buying behaviors following highly publicized product recalls. Research results indicated that recalled products affected the sales of all other toys in their category by as much as 30%, reflecting a spillover effect leading consumers to adjust their expectations regarding the safety or quality of certain products based upon information concerning similar products.

Of significant importance to the study of the spillover effect, Freedman et al. (2010) found that the sales of manufacturers who were not at all involved in the recall also dropped by about 30%, indicating that the recalls in the industry had a negative spillover effect, not only on the product manufacturers in question, but also on the toy industry as a whole. The researchers concluded that recall information regarding specific toys created a spillover effect leading consumers to infer and adjust their judgment regarding the safety and quality of all toys in the market.

The spillover phenomenon may be explained by the associative learning model, developed by Rescola and Wagner (1972). According to this model, any sign or stimuli that helps individuals forecast an outcome, is deemed predictive. Furthermore, individuals learn to predict certain outcomes based upon the simultaneous presence of different signs, which ultimately creates the spillover effect (Shanks, Jacobson, & Kaplan, 1996). The spillover effect occurs most often, according to Wegner and Wheatley (1999), when the need for decision or action is acute.

CHAPTER THREE: METHODOLOGY

Intoduction

Studies of the placebo effect in marketing focused, thus far, on the effect resulting from a change or manipulation of one marketing element—primarily price—and condition, expectancy and motivation as main drivers producing the placebo effect with adults (Shiv et al., 2005b; Berns, 2005; Irmak, 2007). While this study was built upon those principles, it particularly focused on brand recognition and perception as triggers of the placebo effect, practically following foundational research conducted by Makens (1964), Allison and Uhl (1964), and later, Amar et al. (2011). This study, therefore, focused on the extent to which children's recognition of a particular brand of running shoes and their positive perceptions of that brand affected their performance in a 50-meter run.

Hypothesis 1(a) is for RQ1, and formally states that:

Hypothesis 1(a): Participants who are exposed to the superior attributes of the brand, and use it in the experiment, will experience a placebo effect, positively affecting their performance in a 50-meter run.

Hypothesis 1(b) is for RQ2, and formally states that:

Hypothesis 1(b): Participants who are exposed to the superior attributes of the brand, but do not use it in the experiment, will experience a spillover effect, negatively affecting their performance in a 50-meter run.

To test theses hypotheses, Test 1 was divided into two parts. In Part I, all participants ran with the "knockoff" shoe (disguised brand), and following a conditioning intervention (valued brand introduction) in Part II, 50% of the participants ran with the

valued brand, while the other 50% continued to run with the "knockoff" shoe. Data from Test1, Part I were compared with data from Test 1, Part II.

Independent Variables: Type of shoe ("knockoff" vs. "real": categorical).

Dependent Variable: Time recorded in a 50-meter run (continuous)

Building upon the classical conditioning, expectancy and motivational theories established by Shiv et al. (2005), Berns, (2005), and Irmak, (2007), this study further suggested that 1) following an introduction to the superior attributes of a brand, there would be a significant difference in expectation and motivation levels between participants who can use the brand and those who were exposed to it but cannot use it; and 2) expectation and motivation directly affect performance. Hypotheses 2(a) and 2(b) are for RQ1 and RQ2:

Hypothesis 2(a): Exposing participants to a brand's superior attributes will result in a statistically significant difference in the motivation and performance expectation levels between participants who are able to use the brand and those who were exposed to the brand's superior attributes, but cannot use it.

Hypothesis 2(b): There is a statistically significant correlation between motivation and performance expectation scores and the performance difference in running time of participant in both Placebo and Spillover groups.

Independent Variables: Type of shoe ("knockoff" vs. "real": categorical).

Dependent Variable: 1) Brand expectation (ordinal); 2) Brand motivation (ordinal).

Additionally, this study assumed that time must be considered as an important factor in sustaining the strength of the placebo effect and the spillover effect. Hypothesis 3 is for RQ3 and formally states that:

Hypothesis 3: The placebo effect and spillover effect generated by positive perception of the brand will diminish over time, and children's performance in a 50-meter run will be closer to baseline levels.

Independent Variable: Type of shoe ("knockoff" vs. "real": categorical).

Dependent Variable: Time recorded in a 50-meter run (continuous).

To test this hypothesis, participants' running times in Test 2 were compared with their running times at Baseline.

Two quasi-experimental (due to the non-random nature of the sample) studies were conducted to effectively test the hypotheses specified above. The first experiment tested both hypotheses 1a and 1b, and demonstrated whether the placebo effect and spillover effect were created by brand recognition and perception. The second experiment was conducted seven days after the first study, and tested hypothesis 3, specifically investigating whether performance levels affected by placebo and spillover in the first study still held over time.

Selection of Participants

This study used a convenience sampling of school children participating in physical education (PE) classes. To ensure statistical reliability, the sample consisted of 100 boys and 100 girls, 9 to 13 years old, attending school in San Diego County. As part of their normal class schedule, students attended PE classes on a daily basis. The sample for this study consisted of students in two PE classes in two different schools. Twenty-

three students did not complete all required elements of the experiment and, therefore, were eliminated from the study, leaving a total of 177 qualified participants for whom data analysis was performed.

This cohort is the fringe of what is referred to in the demographic literature as "tweens," children in the transition between being adolescent to becoming a teenager (LaChance, Beaudoin, & Robitaille, 2003). According to Smith (2013), this demographic cohort in the U.S. consists of over 20 million boys and girls and is, directly and indirectly, responsible for about $200 billion of spending per year (see Figure 3). Tweens' straightforward, well-informed and well-defined sense of style is critical to the success of current brands and the effective emergence of future brands. This might explain the fact that marketers spend an estimated $17 billion annually to grab their attention and support (Smith, 2013).

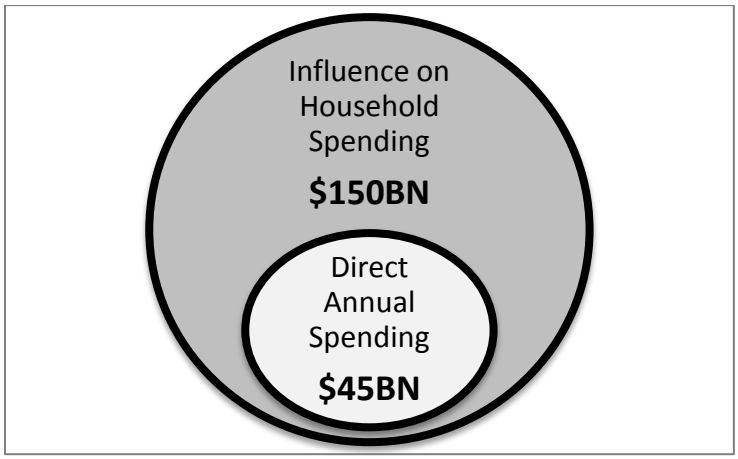

Figure 3. Tween Sensibility, Spending, & Influence (EPMcom, 2012)

Tweens are extremely brand conscious, and use brands to establish social status and acceptance. According to Smith (2013);

> Tweens are the most brand-conscious generation yet and are exposed to over 30,000 brands. With such prevalence, it is no wonder that for tweens it is far more important to wear the right label than it is to wear the right clothes. (p. 6)

The right label, according to Achenreiner (2003), means the right brand name.

Achenreiner (2003) conducted a study with children 8, 12, and 16 years old in an attempt to determine at which age in that range brand names alone play a significant factor in their perceptual judgment. Participants were asked to evaluate two advertisements for an athletic shoe. The shoes were physically identical, however one boasted the highly respected brand name Nike®, while the other was presented under the lower regarded brand name Kmart®. The study results indicated that participants predominantly judged the Nike® shoe a better quality, much "cooler" shoe than the Kmart® shoe, not realizing they were evaluating the exact same shoe. These results were most prominent among the 12-year old participants (Achenreiner, 2003).

Instrumentation

This quantitative study used two types of measurement instruments:

1. Two separate Likert-type surveys (see Appendices A and B) to measure independent variables:
    a. Participants' expectations, following a conditioning intervention, with regard to brand efficacy and their performance with the brand
    b. Participants' motivation, following a conditioning intervention, to experience improved performance
2. A summary sheet including student number and running time in each test (see Appendices C, D, and E). A stopwatch was used to measure running time in a 50-meter run measured over four different instances: 1) participants run with their own shoes; 2) participants run with branded shoes (Nike®) disguised as

knockoffs; 3) half of participants run with branded shoes (Nike®), and half run with branded shoes (Nike®) disguised as knockoffs; 4) fourteen days later, participants run with their own shoes.

Instrument 1: Survey

To test the assumptions indicated in hypotheses 1 and 2, participants experienced a conditioning intervention, which included reading and viewing information regarding the brand of running shoes that was utilized in the experiment. Following the conditioning intervention, and prior to conducting test number 2 (half of participants run with branded shoes, and half run with branded shoes disguised as knockoffs), all participants were handed two different survey questionnaires.

The first survey measured participants' overall expectation of brand and personal performance, and included the following questions:

1. How likely is it that the Nike® Free Run 5.0 shoes you just learned about will deliver the performance it promised to?
2. How likely is it that the Nike® Free Run 5.0 shoes you just learned about will improve your running-speed if you were to wear it in the race?

Participants answered these questions using a five-point Likert scale in which "1" would indicate "not likely at all" and "5" would indicate "very likely."

The second survey measured participants' overall motivation to experience the brand's promised attributes, and to improve personal performance, and included the following questions:

1. How much would you like this pair of Nike® Free Run 5.0 shoes to improve your running speed?

2. How much would you like this pair of Nike® Free Run 5.0 shoes to help you win the race?

Participants answered these questions using a five-point Likert scale in which "1" would indicate "not at all" and "5" would indicate "very much."

Instrument 2: Running Time Summary Sheet

A summary sheet including student number and running time in each test (see Appendices C, D, and E) was utilized to record participants' performance. An Ultrak 499 professional stopwatch was utilized to measure and record participants' running times in the 50-meter run (dependent variable in all hypotheses).

Methodological Assumptions

As in all social and behavioral research, this study also stood the test of validity and relabiity. Whilethese issues are, by and large, mitigated in a quantitative research method, which isolates investigated categories, other tools were utilized to ensure that this reaearch ultimately investigated what it set to investigate and could be replicated under similar conditionins.

The normal distribution of the pre-test results was evaluated to ensure that no skipped questions or errors due to misunderstanding of questions or specific words occurred, and that questions in the survey were clear and easy to understand. Using SPSS software version 21 for statistical analysis, a Cronbach alpha statistical test was conducted in order to ensure that results adhered to the study's objective of 95% co-efficient interval (or $\alpha = .05\%$) and represented a high level of statistical significance. This also ensured reliability and applicability of the results to the general participant's population.

Procedure

One hundred seventy seven students (*N*= 177: 85 boys and 92 girls) attending two San Diego schools participated in this study. Following approval by the school administration and study coordination with the appropriate Physical Education teachers, participation consent letters were sent to parents, and an additional participation consent letter was signed by every student participating in the study.

Two different schools, and two classes from each school, participated in the study. Students ran in pairs, or four at a time, during a normal PE class. Students' shoe sizes were collected in advance. A total of 40 pairs of Nike® Free Run 5.0 shoes (see Figure 4) were used in the study. Twenty pairs used disguised brand name and symbols, and 20 pairs with visible brand name and symbols. A shoe disinfectant spray was used as participants shared the shoes throughout the experiment.

Figure 4. Nike® Free Run 5.0

Four data measurements were collected during the study. The first measurement consisted of participants' running time in the 50-meter run at a baseline level in their own shoes. This data was measured on the running track, using a stopwatch and recorded in a Running Time Summary Sheet (see Appendices C, D, and E). The second measurement,

Test 1, Part I, was collected 15-minutes after the baseline measurement, with all participants running with "knockoff" shoes (shoes with completely disguised brand elements). This data was subsequently measured utilizing the same instrument as in the previous run.

The third measurement was collected following a conditioning treatment, which was conducted at the track. Expectancy questionnaires (see Appendix A), and Motivational questionnaires (see Appendix B) were distributed to all participants after the conditioning treatment, and before they conducted Test 1, Part II (half of participants ran with branded shoes, specifically Nike®, and half ran with branded shoes, Nike®, disguised as knockoffs). This was the only time the questionnaires were used. The fourth set of data was collected seven days after the initial intervention, with participants running with their own shoes. The running times were recorded utilizing the same instrument at each stage of data collection.

In summary, the research design consisted of a quasi-experimental, multi-stage design with four repeated measurements; 1) baseline, 2) pre-placebo, 3) placebo + spillover, and 4) longitudinal placebo with an intervention in Test 1 between Part I and Part II. (Figure 5).

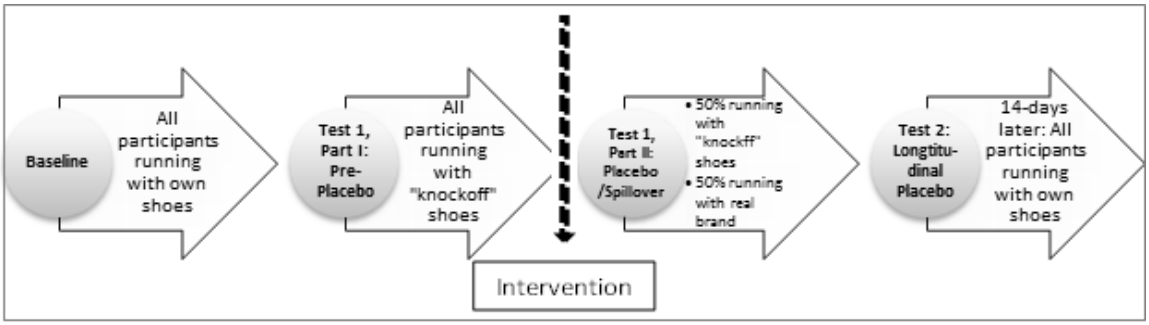

Figure 5. Research Procedure

Data Processing and Analysis

Using the SPSS software for statistical analysis, a Cronbach alpha statistic test was conducted in order to ensure results adhered to the study's objective of 95% co-efficient interval (or $\alpha = .05\%$) and represented a high level of statistical significance. This also ensured reliability and applicability of the results to the general participant's population.

Following basic frequency analysis, paired sample t-tests were conducted to test the four hypotheses in Test 1 (Parts I and II), evaluating the placebo effect in run-time performance among participants who were using shoes considered as "branded" (Placebo group) versus those who were using shoes considered as "knockoff" (Spillover group).

The paired samples *t*-test methodology has been successfully utilized in experimental and non-experimental settings to determine whether there are significant differences between matched measurements of results repeated under diverse conditions. It has been utilized in the social sciences to evaluate the strength of intervention responses (Chapman et al., 2009) in the cognitive-behavioral sciences to evaluate treatment effectiveness for mental health outcomes (Frazier et al., 2004), and in the educational sciences to evaluate the effect of knowledge on attitudinal outcomes (Bradley, Waliczek, & Zajicek, 1999). Thus, it was deemed an appropriate approach to evaluate data in this study.

Additionally, the Mann-Whitney Wilcoxon (MWU) test was utilized to compare the expectation and motivation scores of the placebo against the non-placebo group. The MWU test is a non-parametric tool utilized to measure the central tendency of one population against another, and has been successfully utilized in the measurement of

Likert-type scale responses (De Winter & Dodou, 2010). In order to establish whether participants' expressed expectation and motivation affected their actual performance (hypothesis 2[a]), a Pearson Correlation analysis was conducted.

Finally, a paired samples *t*-test was used again to compare participants' mean performance in Test 1, Part II (following the placebo and spillover effects) and their Baseline performance, in order to determine whether there a longitudinal impact is generated by the placebo effect or the spillover effect. The following chapter summarizes the findings of all the experimental tests.

CHAPTER FOUR: RESEARCH RESULTS

Overview

The purpose of this study was to demonstrate that positive brand perception can directly impact performance, of not only the person using the brand, but also, through a spillover effect, the performance of a person who is exposed to the brand, but is unable to use it.

Two hundred children ages 9 to 13 years old participated in this study. Twenty-three students did not complete all required elements of the experiment and, therefore, were eliminated from the study, leaving a total of 177 (N=177) qualified participants for whom data analysis was performed.

Variables in the Study

The independent variable, type of shoe, included two levels: (a) "branded" and (b) "knockoff". The dependent variables included continuous variables consisting of repeated measures of running time under different conditions, and four categorical variables measuring participants' expectation and motivation with regards to their performance.

Table 1.

Gender Distribution

		f	%
Valid	Male	85	48.0
	Female	92	52.0
	Total	177	100.0

Results

Sample characteristics

Data was entered into SPSS version 21 for analysis. The initial descriptive exploration revealed the characteristics as shown in Table 1 and 2.

Table 2.

Average Running Scores (Baseline, Tests 1,2 &3)

	Min	Max	*M*	*SD*
Running score with own shoes	6.03	11.84	8.5797	.87445
Test 1 – Pre-Placebo (all with nonbranded)	6.16	11.77	8.5032	.86443
Test 2 – Placebo + Spillover (50% branded; 50% nonbranded)	6.18	10.89	8.4079	.88168
Test 3 – Longitudinal Placebo (all with own shoes)	6.15	11.52	8.6196	.82889

Testing was performed under the assumption of a normally distributed sample with a mean μ and standard deviation σ.

Test 1: The Placebo and Spillover Effects

The purpose of Test 1 was to determine whether recognition of a running shoe brand impacts participants' performance in a 50-meter run. The test was divided into two parts. In Part I, all participants were asked to run in shoes with no brand identification ("Knockoff"). In Part II, the branded shoe was introduced to all participants (conditioning intervention). Half of the participants were asked to run with the branded shoes, while the other half were asked to run again with the "knockoff" shoe.

Hypothesis 1(a): Participants who are exposed to the superior attributes of the brand, and use it in the experiment, will experience a placebo effect, positively affecting their performance in a 50-meter run.

Hypothesis 1(b): Participants who are exposed to the superior attributes of the brand, but do not use it in the experiment, will experience a spillover effect, negatively affecting their performance in a 50-meter run.

Two paired samples *t*-test were utilized to evaluate Hypotheses 1(a) and 1(b). Consistent with this study's hypothesis, there was a significant increase in running time between the pre-placebo Test 1, Part I (all participants running with disguised "knockoff" shoes), and Test 1, Part II, participants running in the placebo and spillover groups (50% running with visible brand; 50% running with disguised "knockoff" brand).

Tables 3, 4, 5, and 6 illustrate the findings for Test 1:

Placebo Group: Branded "Real" Shoes

Table 3.

Paired Samples Statistics – Placebo Group

Pair 1	*M*	*N*	*SD*	*SEM*
Test 1, Part I – Pre-Placebo (all with nonbranded)	8.51	93	.87	.08975
Test 1, Part II – Placebo + Spillover (50% branded; 50% nonbranded)	8.09	93	.80	.08324

The findings in Table 3 and Table 4 indicated a significant decrease in running time for participants running with the branded ("real") shoes (see hypothesis 1a above). From *M*= 8.51 seconds, *SD* = .87 seconds to *M*=8.09 seconds *SD* =. 80 seconds, at the

.00 level of significance, *t*=-12.38, *df*=92, *n*= 93, *p* < .00, 95% CI for mean difference .35 to .48, *r* =.93. Hence, these finding reject the null hypothesis and support the alternative hypothesis (H1a), which states: "Participants who are exposed to the superior attributes of the brand, and use it in the experiment, will experience a placebo effect, positively affecting their performance in a 50-meter run."

Table 4.

Paired Samples Test – Placebo Group

				95% CI				
	M	*SD*	*SEM*	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Test 1, Part I – Pre-Placebo (all with nonbranded) – Test 1, Part II – Placebo + Spillover (50% branded; 50% nonbranded)	.417	.325	.03368	.35	.48	12.38	92	.000

Note. CI= Confidence Interval

Spillover Group: "Knockoff" Shoes

Conversely, for participants running with the "knockoff" shoes (the spillover group—see H1b above), there was a significant increase in running time. From *M*= 8.49 seconds, *SD* = .87 seconds to *M*=8.76 seconds *SD* =84 seconds, at the .00 level of significance, *t*=-5.54, *df*=83, *n*= 84, *p* < .00, 95% CI for mean difference -.35 to -.17, *r* =.87. Hence, these findings reject the null hypothesis and support the alternative (H1b) hypothesis, which states: "Participants who are exposed to the superior attributes of the brand, but do not use it in the experiment, will experience a spillover effect, negatively affecting their performance in a 50-meter run."

Table 5.

Paired Samples Statistics – Spillover Group ("Knockoff")

		M	*N*	*SD*	*SEM*
Pair 1	Test 1, Part I – Pre-Placebo (all with nonbranded)	8.49	84	.86835	.09474
	Test 1, Part II – Placebo + Spillover (50% branded; 50% nonbranded)	8.76	84	.83591	.09121

Research findings are congruent with this study's proposed hypotheses 1(a) and 1(b), and confirm that there is a statistically significant difference in the mean running time between the "placebo" and "spillover" groups and a statistically significant difference in the mean running time in Test 1, Part I versus Test 1, Part II, within each group of participants, namely: the "placebo" group ran faster, on average, in Test 1, Part II, while the "spillover" group ran slower, on average, in Test 1, Part II. Both hypotheses 1(a) and 1(b) were, therefore, confirmed.

Hypothesis 2(a): Exposing participants to a brand's superior attributes will result in a statistically significant difference in the motivation and performance expectation levels between participants who are able to use the brand and those who were exposed to the brand's superior attributes, but cannot use it.

Table 6.

Paired Samples Test- Spillover Group

				95% CI				
	M	*SD*	*SEM*	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Test 1, Part I – Pre-Placebo (all with nonbranded) – Test 1, Part II – Placebo + Spillover (50% branded; 50% nonbranded)	-.26	.43	.047	-.35	-.17	-5.5	83	.000

Note. CI= Confidence Interval

Four Mann-Whitney ranks comparison tests were utilized to evaluate Hypothesis 2(a), namely, that there is a significant difference in the motivation and performance expectation scores of children running with "real" branded shoes vs. those running with "knockoff" non-branded shoes (see Appendices A and B). The two scores for expectation and the two scores for motivation were compared between the Placebo group (participants using branded "real" shoes) versus the Spillover group (participants using non-banded "knockoff" shoes). Consistent with this study's hypothesis, there was a significant difference in one out of the two expectation scores and both of the motivation scores between test and non-placebo groups.

Table 7.

Ranks

	Brand	*N*	*MR*	*SR*
Expectation 1 – Expectation of branded shoe to deliver on performance promises	Branded	93	89.13	8289.00
	Disguised	84	88.86	7464.00
Expectation 2 – Expectation of branded/ nonbranded shoe to improve running speed	Branded	93	124.78	11605.00
	Disguised	84	49.38	4148.00
Motivation 1 – Motivation to improve running speed	Branded	93	111.07	10329.50
	Disguised	84	64.57	5423.50
Motivation 2 – Motivation to have branded/ nonbranded shoes to help win race	Branded	93	115.46	10737.50
	Disguised	84	59.71	5015.50

Note. Total *N* for each category =177, *MI*=Mean Rank, *SR*= Sum of Ranks

The results of the Mann Whitney U Test, comparing the median scores for expectation 1 ("How likely is it that the Nike® Free Run 5.0 shoes you just learned about will deliver the performance it promised to?") between the non-placebo group wearing "knockoff" shoes and the placebo group wearing "real" shoes, found that these scores were not significantly different between the two groups (z=-.038, $p < .001$).

Conversely, scores for expectation 2 ("How likely is it that the Nike® Free Run 5.0 shoes you just learned about will improve your running-speed?") were found to be significantly different between the two groups (z=-10.08, $p < .001$). The mean score for the group using non-branded shoes was 49.4 whereas the mean rank for the group running with branded shoes was higher at 124.8.

Table 8.

Test Statistics [a]

	E1	E2	M1	M2
Mann-Whitney U	3894.000	578.000	1853.500	1445.500
Wilcoxon W	7464.000	4148.000	5423.500	5015.500
z	-.038	-10.081	-6.242	-7.460
Asymp. Sig. (2-tailed)	.970	.000	.000	.000

Note. [a] Grouping Variable: Brand/Non Brand. E1 = Expectation of branded shoe to deliver on performance promises; E2 = Expectation of branded/nonbranded shoe to improve running speed; M1 = Motivation to improve running speed; M2 = Motivation to have branded/nonbranded shoes to help win race.

Scores for motivation 1 ("How much would you like this pair of Nike® Free Run 5.0 shoes to improve your running speed?") were found to be significantly different between the two groups (z=-6.24, $p < .001$). The mean score for the group using non-branded shoes was 64.57 whereas the mean rank for the group running with branded shoes was higher at 111.07. The mean score for the group using non-branded shoes was 49.4 whereas the mean rank for the group running with branded shoes was higher at 124.8.

Scores for motivation 2 ("How much would you like this pair of Nike® Free Run 5.0 shoes to help you win the race?") were found to be significantly different between the two groups (z=-7.46, $p < .001$). The mean score for the group using non-branded shoes was 59.71 whereas the mean rank for the group running with branded shoes was higher at 115.46.

The findings above are congruent with this study's proposed hypothesis 2(a), namely, that there is a significant difference in the motivation and performance

expectation scores of children running with “real” branded shoes vs. those running with “knockoff“ non-branded shoes.

Hypothesis 2 (b): There is a statistically significant correlation between motivation and performance expectation scores and the performance difference in running time of participant in both Placebo and Spillover groups.

Table 9.

Correlations

		E1	E2	M1	M2	diff
E1	Pearson Correlation	1	.093	.110	.116	.053
	Sig. (2-tailed)		.219	.146	.124	.487
	N	177	177	177	177	177
E2	Pearson Correlation	.093	1	.472**	.495**	.475**
	Sig. (2-tailed)	.219		.000	.000	.000
	N	177	177	177	177	177
M1	Pearson Correlation	.110	.472**	1	.499**	.357**
	Sig. (2-tailed)	.146	.000		.000	.000
	N	177	177	177	177	177
M2	Pearson Correlation	.116	.495**	.499**	1	400**
	Sig. (2-tailed)	.124	.000	.000		.000
	N	177	177	177	177	177
diff	Pearson Correlation	.053	.475**	.357**	.400**	1
	Sig. (2-tailed)	.487	.000	.000	.000	
	N	177	177	177	177	177

Note. ** Correlation is significant at the 0.01 level (2-tailed). E1 = Expectation of branded shoe to deliver on performance promises; E2 = Expectation of branded/nonbranded shoe to improve running speed; M1 = Motivation to improve running speed; M2 = Motivation to have branded/nonbranded shoes to help win race.

Correlation analysis was performed to test hypothesis 2(b), namely, that there is a statistically significant correlation between motivation and performance expectation

scores and the performance difference in running time of participant in both placebo and non-placebo groups. A preliminary step in the correlation analysis was to subtract the running time for Test 2 from the running time scores for Test 1. The difference of these scores was recorded as a continuous measure of performance change across both groups. Subsequently, the newly created performance change score was correlated with the two expectation scores and the two motivation scores. Table 9 illustrates the findings.

The correlation analysis showed that there was a significant positive correlation between the difference score for running time of participants and the score for Expectation 2 ("How likely is it that the Nike® Free Run 5.0 shoes you just learned about will improve your running-speed?"), Motivation 1 ("How much would you like this pair of Nike® Free Run 5.0 shoes to improve your running speed?"), and Motivation 2 ("How much would you like this pair of Nike® Free Run 5.0 shoes to help you win the race?"). These findings further support Hypothesis 2(b) and confirm that participants' expectation and motivation levels strongly correlate with their running performance.

Test 2: Longitudinal Placebo and Spillover Effect

Hypothesis 3: The placebo effect and spillover effect generated by positive perception of the brand will diminish over time, and children's performance in a 50-meter run will be closer to baseline levels.

Table 10.

Paired Samples Statistics – All Participants

		M	*N*	*SD*	*SEM*
Pair 1	Baseline: Running score with own shoes	8.5797	177	.87445	.06573
	Test 2: Longitudinal Placebo (all with own shoes)	8.6196	177	.82889	.06230

Two paired samples t-tests were utilized to evaluate Hypothesis 3, namely, that the placebo effect and spillover effect would diminish overtime and return to baseline levels. Table 10 illustrates the findings for test 2:

Table 11.

Paired Samples Test – All Participants

				95% CI				
	M	*SD*	*SEM*	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Baseline: Running score with own shoes Test 2: Longitudinal Placebo (all with own shoes)	-.03994	.41566	.03124	-.10160	.02172	-1.278	176	.203

Note. CI= Confidence Interval

Consistent with this study's hypothesis, there was no significant difference between participants' running times in Test 2 and their running time at Baseline (*M*= 8.58 seconds, *SD* = .78 seconds at Baseline and *M*=8.62 seconds. *SD* = .81 seconds in Test 2), *t*=-1.28, *df*=176, $p > .05$.

Investigating further within the two groups of participants, namely the "Placebo" group and the "spillover" group, revealed interesting results. The findings showed that no statistically significant difference was found in the running scores in Test 2 versus Baseline for the "placebo" group: *M*=8.53 seconds, *SD*=.87 seconds at Baseline, and *M*=8.57 seconds, *SD*=.93 seconds in Test 2), *t*=-1.14, *df*=92, $p > .05$. (See Tables 12 and 13).

Table 12.

Paired Samples Statistics – Placebo Group

		M	*N*	*SD*	*SEM*
Pair 1	Test 2 – Longitudinal Placebo – "Placebo" Group (all with own shoes)	8.5308	93	.86843	.09005
	Running score with own shoes (Placebo Group)	8.5745	93	.93180	.09662

Table 13.

Paired Samples Test – Placebo Group

				95% CI				
	M	*SD*	*SEM*	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Test 2 – Longitudinal Placebo – "Placebo" Group (all with own shoes) – Running score with own shoes (Placebo Group)	-.04376	.37	.038	-.12010	.03258	-1.139	92	.258

Note. CI= Confidence Interval

Conversely, a significant difference was revealed between Test 2 and Baseline running times for the "Spillover" group: from *M*= 8.72 seconds, *SD*= .78 seconds, to *M*=8.59 seconds, *SD* =. 81 seconds, *t*=-2,74, *df*=83, *n*=84, $p < .00$ (see Tables 14 and 15).

Table 14.

Paired Samples Statistics – Spillover Group

		M	*N*	*SD*	*SEM*
Pair 1	Test 2 – Longitudinal Placebo – "Spillover" Group (all with own shoes)	8.72	84	.77608	.08468
	Running score with own shoes (Spillover Group)	8.59	84	.81179	.08857

Null hypothesis 3, states "there is no statistically significant difference on the mean running time of children measured seven days after Test 2, part II, and the running time at Baseline level" was confirmed. Based on the cumulative results of both groups, the null hypothesis cannot be rejected. However, for the Spillover group, the hypothesis test suggested that the running time measured seven days after the intervention was higher than the initial Baseline levels. In other words, seven days after the placebo intervention, participants in the spillover group ran slower than they had at the baseline level (their pre-conditioned normal running speed with their own shoes). This finding could be profound as it might suggest that the negative, spillover effect of the placebo in this experiment does carry on longer than the positive placebo effect.

Table 15.

Paired Samples Test – Spillover Group

				95% CI				
	M	*SD*	*SEM*	Lower	Upper	*t*	*df*	Sig. (2-tailed)
Test 2- Longitudinal Placebo (all with own shoes) – Running score with own shoes (Spillover Group)	.13262	.44443	.04849	.03617	.22907	2.74	83	.008

Note. CI= Confidence Interval

Discussion

This study intended to investigate whether or not brand perception and affinity carries a placebo effect that not only impacts the performance of the brand user, but also that of individuals who are exposed to the brand but are unable to use it. Specifically, the study focused on following three research questions:

RQ1: Can brand recognition and perception lead to a placebo response that impacts product performance and efficacy among school children?

RQ2: Does the brand placebo effect demonstrated in RQ1, carry a spillover effect that impacts the performance of children who were exposed to the brand, but are unable to use it?

RQ3: Are brand-generated placebo and spillover effects a permanent phenomenon, or simply a temporary episode limited to the immediate time of exposure?

RQ1 (Can brand recognition and perception lead to a placebo response that impacts product performance and efficacy among school children?) was answered through the following hypothesis:

Hypothesis 1(a): Participants who are exposed to the superior attributes of the brand, and use it in the experiment, will experience a placebo effect, positively affecting their performance in a 50-meter run.

The findings of Test 1, Part II clearly indicated a significant improvement in the performance in the 50-meter run of participants who ran with the visible brand compared to their performance in Test1, Part I—brand elements invisible—(From M= 8.51 seconds to M=8.09 seconds). These findings affirm hypothesis 1(a), and provide a positive answer to RQ1, namely that brand recognition and perception lead to a placebo response that affects participants' performance with the brand. Considering that in Test 1, Part I (invisible brand elements) and Test 1, Part II (visible brand elements) the children were running with the exact same shoe, this indicates that merely the exposure to the brand elements and the children's affinity to the brand led to the significant difference in their performance.

RQ2 **(**Does the brand placebo effect demonstrated in RQ1, carry a spillover effect that impacts the performance of children who were exposed to the brand, but are unable to use it?) was answered by the following hypothesis:

Hypothesis 1(b): Participants who are exposed to the superior attributes of the brand, but do not use it in the experiment, will experience a spillover effect, negatively affecting their performance in a 50-meter run.

The findings of Test 1, Part II clearly indicated significant negative difference in the performance in the 50-meter run of participants who were exposed to the brand, but were unable to use it in the experiment (From *M*= 8.49 seconds in Test 1, Part I to *M*=8.76 seconds in Test 1, Part II). These findings affirm hypothesis 1(b), and provide a

positive answer to RQ2, namely that participants who were exposed to the brand, but were unable to use it, experienced a spillover effect, negatively impacting their performance in the 50-meter run. This finding is in spite of the fact that in Test 1, Part I and Test 1, Part II all participants were running with the exact same shoe.

RQ1 and RQ2 were further supported by findings regarding the impact of participants' expressed expectation and motivation on the placebo and spillover effects displayed in Test 1, Part II. First, the impact of brand recognition and perception on participants' performance expectation and motivation was explored through the following hypothesis:

Hypothesis 2(a): Exposing participants to a brand's superior attributes will result in statistically significant differences in the motivation and performance expectation levels between participants who are able to use the brand and those who were exposed to the brand's superior attributes, but cannot use it.

Findings of the Mann Whitney analysis indicated significant differences between the two groups when the questions centered on their expectation and motivation regarding their performance with (or without) the brand (see Appendix A, Question 2; and Appendix B, Questions 1 and 2). In general, the Placebo group indicated high performance expectation and motivation levels, while the Spillover groups indicated low expectation and motivation levels.

However, no significant difference was found between the groups when asked to evaluate the brand, i.e., their expectation regarding the capability of the highlighted brand to impact their performance (see Appendix A, Question 1). Both groups indicated high expectation levels.

In order to substantiate the relationships between participants' levels of expectation and motivation and their ultimate performance the following hypothesis was tested:

Hypothesis 2(b): There is a statistically significant correlation between motivation and performance expectation scores and the performance difference in running time of participant in both Placebo and Spillover groups.

The Spearman Correlation test found a strong positive correlation between participants' expressed expectation and motivation and their performance in Test 1, Part II (50% of participants with "real" brand; 50% of participants with "knockoff" brand). These results further solidify the affirmative answers indicated for RQ1 and RQ2.

Finally, Research Question 3 (Are brand-generated placebo and spillover effects a permanent phenomenon, or simply a temporary episode limited to the immediate time of exposure?) was answered through the following hypothesis:

Hypothesis 3: There is a statistically significant difference on the mean running time of children measured seven days after initial intervention and the running time at baseline level.

The findings showed no significant difference (supporting the null hypothesis) in running times for the Placebo group, effectively indicating a waning placebo effect already seven days after its appearance. The findings, however, showed a significant difference in running time between Baseline and Test 2 (all running with own shoes) for the Spillover groups (Test 1, Part II participants who were exposed to the brand but unable to use it). Seven days after the intervention (and Spillover effect appearance), these participants had a significantly slower running time compared to Baseline. These

findings support hypothesis 3 for the Spillover group, indicating that while the Placebo effect may be waning overtime, the spillover effect may have longitudinal attributes.

The following chapter provides a comprehensive summary of this study and highlights its conclusions.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

This study investigated the placebo effect of positive brand perception and affinity on children's performance in a 50-meter run. In addition, this study examined the presence of a spillover effect, namely that the placebo effect spills over and negatively affects the performance participants, who are exposed to the brand, but are unable to use it. Furthermore, this study attempted to confirm previous studies' findings regarding the elements contributing to a placebo effect: conditioning, expectation, and motivation (Berns, 2005; Irmak, 2007; Geers et al., 2005; Stewart-Williams & Podd, 2004). Finally, the longitudinal attributes of the placebo and spillover effects were tested one week after the initial experiment, in order to demonstrate whether or not these effects are long-lasting or are exhibited only during the time of intervention.

One hundred seventy seven (N=177) boys and girls ages 9 to 13 years old participated in this study. This "tween" cohort was particularly selected as it represents a growing segment of the population who is extremely brand conscious and is considered by analysts as a market trend setter with close to $200 billion direct and indirect expenditure impact (Smith, 2013).

A quasi-experimental, multi-stage design was deemed most appropriate for this study, and included four repeated measurements: 1) baseline – in which participants ran with their own shoes, 2) pre-placebo – in which all participants ran with the branded shoe with all brand elements in disguise, 3) placebo + spillover – in which roughly one half of the participants ran with the branded shoe with visible brand elements and the rest with

the branded shoe with all brand elements in disguise, and 4) longitudinal placebo – in which participants ran again with their own shoes one week after the baseline measure.

The findings clearly demonstrated that following a brand exposure (conditioning intervention), participants significantly improved their running scores (from 8.51 seconds to 8.09 seconds). And conversely, running scores of participants who were exposed to the brand during the conditioning intervention, but continued to run with the "knockoff" shoe (same branded shoe but with disguised brand elements) significantly worsened (from 8.49 seconds to 8.76 seconds).

Findings demonstrated further that following the conditioning intervention, participants' expectations regarding their performance and motivation to realize that expectation directly affected their ultimate performance. Participants who expressed high performance expectation and motivation levels indeed improved their running scores. Participants who expressed low performance expectation and motivation levels indeed realized a negative impact on their running scores.

Finally, interesting results were found with regard to the longitudinal attributes of the placebo and spillover effects. Tested with their own shoes again, seven days after their first, baseline run, participants who ran during the experiment with the branded shoe (all brand elements clearly visible) generally returned to their baseline, pre-experiment running scores. However, participants who, following the brand conditioning intervention, continued to run with the "non-branded" shoe (same as branded shoe, only with disguised brand elements) demonstrated a continued placebo spillover impact, with worse running scores compared to their baseline, pre-experiment performance.

With these findings, this study confirms previous studies of the placebo effect in marketing (Shiv et al., 2005; Irmak, 2007; Amar et al., 2011), and research regarding conditioning (Ader & Cohen, 1975; Irmak, 2007), expectation (Hamerman & Johar, 2013; Shiv et al., 2005), and motivation (Geers et al., 2005; Irmak, 2007) as important factors contributing to the placebo effect.

Nevertheless, this study introduces two additional elements to the research of the placebo effect of brands. The first is the placebo spillover effect, which suggests that brand power can transcend beyond the actual user and negatively impact individuals' performance with comparable, but lesser perceived brands. The second is the longitudinal attributes of the placebo effect, which investigated the prevalence of the placebo impact over time. These two elements have not been studied before in this context, and constitute the most significant contribution of this study to the field of the placebo effect in marketing research, a contribution that is discussed in detail later in this chapter.

Conclusions

Following foundational research on the placebo effect of marketing conducted by Allison and Uhl (1964), Amar et al. (2011), Irmak (2007), Shiv, et al. (2005b), and others, the purpose of this study was to demonstrate that brand perception alone can generate a placebo response affecting children's performance in a 50-meter run. To that end, a quasi-experimental research was conducted, focusing on the following questions:

RQ1: Can brand recognition and perception lead to a placebo response that impacts product performance and efficacy among school children?

RQ2: Does the brand placebo effect demonstrated in RQ1, carry a spillover effect that impacts the performance of children who were exposed to the brand, but are unable to use it?

RQ3: Are brand-generated placebo and spillover effects a permanent phenomenon, or simply a temporary episode limited to the immediate time of exposure?

The findings of this study were very conclusive with regard to the three research questions. Consistent with the research of Makens (1964), Allison and Uhl (1964), and Amar et al. (2011), this study clearly demonstrated that brand perception (in this case, Nike®) could, through a placebo effect, directly impact product performance. Participants who first ran with the disguised brand elements significantly improved their running time in the subsequent run, in which the Nike® brand elements were clearly visible (from 8.51 seconds to 8.09 seconds). These findings, therefore, provide a resounding positive answer to RQ1, and uphold that brands are not merely an abstract concept; rather they directly and tangibly impact product performance and consumers' physiological experience.

Furthermore, if the conditioning intervention, which separated the two runs (once with disguised brand elements and once with visible brand elements), would be considered a marketing action (promotion), the findings of this study would suggest that effective brand promotion could result in a placebo effect that impacts product performance. This conclusion is consistent with Shiv et al.'s (2005a), and Irmak's (2007) theory of the placebo effect of marketing actions. According to this theory, brand perception (in this study induced by promotional conditioning) evokes specific consumer expectations, which can alter the actual efficacy of the marketed product.

With regard to the brand placebo spillover effect investigated for RQ2, this study presents a breakthrough in the research of the placebo effect in marketing, as the brand placebo spillover phenomenon has not been studied before in this context. The research findings clearly demonstrated that the running performance of participants who were exposed to the Nike® brand of running shoes, but subsequently continued to run with what they believed to be a "knockoff" shoe, significantly worsened (from 8.49 seconds to 8.76 seconds). Consequently, it might be concluded that the brand power (or brand equity) transcends beyond actual use and impacts not only the user's performance (positively), but also the performance of competing brands (negatively).

These findings are consistent with Rescola and Wagner's (1972) model of associative learning. According to this model, any sign or stimuli that helps individuals forecast an outcome, is deemed predictive. Participants who were exposed to the conditioning intervention highlighting the "superior" attributes of the Nike® shoe, immediately assumed that the running shoe they were using was inferior and, therefore, would negatively impact their performance—a prediction that ultimately materialized. Furthermore, these finding are consistent with Shanks, Jacobson, and Kaplan's (1996) assertion that individuals learn to predict certain outcomes based upon the simultaneous presence of different signs (in this case, the presence of the "real" Nike® brand), which ultimately create the spillover effect.

In order to solidify the understanding of the brand placebo and spillover effects demonstrated in this research, a further investigation was conducted to confirm the role expectations and motivation play in this phenomenon. Evaluating participants' expressed performance expectations and motivation levels following a conditioning intervention,

this study found a direct correlation between participants' expected performance and actual performance, as well as a direct correlation between participants' performance motivation and actual performance. Findings conclusively suggest that participants who expected improved performance with the "real" Nike® shoe indeed performed better. Similarly, participants who expressed increased motivation to perform better with the "real" brand, did, in fact, perform better. Conversely, participants who expressed low performance expectations and motivation, ultimately experience worsened performance.

These finding are consistent with Kirsch's (2004) response expectancy theory, suggesting that individuals' anticipation for a particular emotional response or experience, actually triggers a placebo effect that leads to the physiological manifestation of that experience. This study's results are also consistent with the model established by Shiv et al. (2005b), which suggested that product efficacy is directly affected by general beliefs (such as the relationships between price and quality) and marketing messages (such as advertising). Both aspects create strong expectancy levels with regard to the product's performance (responses expectation), which ultimately leads to the enhanced performance outcomes by participants (Irmak, 2007). Further support to these findings is found in extensive research (Shiv, et al., 2005a; Irmak, 2007; Geers, 2004; Berns, 2005; Stewart-Williams & Podd, 2004), which generally argues that conditioning (in this study, the presentation and highlight of the "real" Nike® brand) is not merely a non-conscious response; rather it does sometimes trigger conscious expectations and motivation intuitions that lead to measurable physiological responses.

The strong correlation found in this study between expectations and motivation and ultimate performance is consistent with studies from the medical field by Price et al.

(1999), Benedetti et al. (2007), and Kleinman et al. (2002),which respectively demonstrated that when patients were conditioned regarding a certain medication by physicians, trusted word-of-mouth, newspaper article, advertising or other external sources, they built a strong belief in the efficacy of that medication, and ultimately experienced significantly better outcomes.

The third research question in this study examined the longitudinal attributes of the brand placebo and spillover effects. To investigate whether or not these effects have long-lasting attributes, the baseline test (all participants run with own shoes) was repeated seven days following the placebo/spillover test. Findings were split on this question. No significant differences were found between the pre-placebo/spillover baseline performance and the post placebo/spillover performance (7 days later) for participants who used the "real" brand (the placebo group) in the placebo/spillover test. However, a significant difference in performance was found between pre and post placebo/spillover tests, showing a continued deterioration of running scores among the spillover group (participants who were exposed to the "real" brand, but could not use it in the placebo/spillover test), potentially suggesting that the negative spillover effect is stronger and longer-lasting than the positive impact of the placebo effect.

The longitudinal aspects of the placebo and spillover effects were never studied before in the context of the placebo effect in marketing. These findings are, therefore, foundational and open the opportunity for further investigation.

In closing, this study offers conclusive answers to the questions set forth at the beginning of this investigation, and suggests that when consumers develop an affinity towards a brand, following conditioning generated by various marketing communications

tactics, they experience an emotional arousal. If, subsequently, they are able to actually use the brand, this emotional arousal leads to high performance expectations and motivation, and ultimately creates a short-lived brand placebo effect that is manifested in better performance. If, however, consumers who build affinity to the brand are unable to use it, and must resort to a perceived inferior brand, this emotional arousal is depleted, leading to low performance expectations and motivation, and a negative brand placebo spillover effect that is manifested in longer-lasting deteriorating performance.

Contribution to Field of Study

From the breakthrough study of Allison and Uhl (1964), through the remarkable demonstration of the placebo effect of marketing actions by Shiv et al. (2005a), to the important work of Geers (2004) and Irmak (2007) in identifying the important role motivation plays in the placebo response, the phenomenon of the placebo effect in marketing was studied over the past four decades in various contexts. While the findings in this study clearly solidify the models introduced by the previously cited researchers, it goes further and introduces new elements that were not studied before in the context of the placebo effect in marketing.

This study might be the first to introduce the concept of the *placebo spillover effect*, demonstrating that strong brand perception and affinity not only results in a placebo effect that positively impacts users' performance, but also carries a placebo spillover effect, negatively impacting performance of individuals who desire the brand, but cannot use it—in fact, applying inferior performance attributes to the competing brand they currently use.

Both the placebo and placebo spillover effects demonstrated in this study challenge traditional marketing concepts, which attribute consumer behavior changes to manual strategic changes associated with the eternal 4Ps of marketing (product, price, promotion, and place). This study empirically suggests that a positive brand perception triggers cognitive and emotional reactions, such as expectations and motivation among brand users and users of less desirable brands, which are manifested physiologically in positive (placebo) or negative (spillover) performance outcomes. As such, this study may be considered foundational in building a predictive placebo/spillover model of brand performance.

This study introduces yet another element to the placebo effects in marketing research: the longitudinal attributes of the placebo and spillover effects. Findings demonstrated that participants who ran with the "real" Nike® brand during the placebo/spillover test reverted to their original baseline scores seven days later, showing no long-term impact of the placebo effect. Conversely, participants who were exposed to the "real" Nike® brand but continued to run with the "knockoff" shoe (spillover group) experienced continued deterioration in their performance (compared to baseline) seven days later, reflecting a long-term impact on the placebo spillover effect. These longitudinal characteristics of the placebo and spillover effects are critically important to understanding these phenomenon and their practical implications in the marketing field. Finally, while previous studies focused on adults only, this study introduced a different demographic cohort: children ages 9 to 13 years old. In addition to simply demonstrating that the placebo effect in marketing is present in this demographic group as well, the inclusion of this "tween" cohort to the research is of significant importance, for it is

considered by many researchers the trend-setting group that ultimately builds or destroys brands (Smith, 2013).

Implications for Practice

The 4Ps (product, price, promotion, place) have been the centerpiece of the marketing practice for many decades. Traditional marketing strategies focus primarily on tactics and ideas to manipulate one or more of the 4Ps (adding product features, changing pricing methodology, increasing promotional effort, reconfiguring distribution channels, etc.) many times independent of their targeted audience's cognitive and emotional experiences. This study unequivocally demonstrated that these cognitive and emotional experiences are not merely in the head of the consumer, but lead to placebo and spillover effects that are physiological and directly impact consumers' product experience and performance.

Acknowledging the presence and magnitude of this phenomenon will help marketing practitioners devise marketing strategies and brand messages that trigger the desired cognitive and emotional responses that can ultimately create the desired placebo effect. This means greater focus on brand building and promotion rather than 4Ps-focused tactics. Demonstrating that a strong brand perception creates a placebo effect that improves product performance, and a spillover effect that impacts even users of other brands, may alter brand communication messages and promotional budgets.

In addition, findings related to the longitudinal attributes of the placebo and spillover effects may help marketers determine the frequency in which marketing campaigns, brand, and product communications should be modified, and the impact it might have on consumers' experience.

Limitations and Recommendations for Future Research

As with any quasi-experimental research (or any research for that matter), this study too, encountered a few limitations that present opportunities for future investigation. This study introduced two important theoretical foundations to the research of the placebo effect in marketing: the placebo spillover effect and the longitudinal characteristics of the brand placebo and spillover effects. While the findings in this study were conclusive for both elements, more research will be necessary to fully solidify the presence and magnitude of the phenomenon.

In addition, this study investigated the presence and impact of brand placebo and spillover effect on American boys and girls ages 9 to 13 years old. However, no data was collected for participants' ethnicity. Different ethnic groups often display different social behaviors that may impact their propensity to respond to particular marketing messages or be affected by the status-defining elements of highly perceived brands. Future research should, therefore, explore the presence and magnitude of the placebo and spillover effects in different ethnic groups in the U.S.

Furthermore, considering the overall high levels of brand consciousness associated with the consumerism culture in the U.S., one must wonder if similar results would be demonstrated in other countries and with different cultures. This presents a great opportunity to further explore and compare the presence and significance of brand placebo and spillover effects in and between different regions of the world (Latin America, Asia, Europe, Middle East, etc.).

Finally, this study confirmed the correlation between participants' performance expectation and motivation following a conditioning intervention and their actual

performance in a 50-meter run. However, the relative weight each of these attributes carry in the placebo and spillover response was not studied, and begs further investigation.

REFERENCES

Achenreiner, G. (2003). The meaning of brand names to children: A developmental investigation. *Journal of Consumer Psychology*, *13*(3), 205–219.

Ader, R., & Cohen, N. (1975). Behaviorally conditioned immunosuppression. *Psychosomatic Medicine, 37,* 333-340.

Ahluwalia, R., Unnava, R., & Burnkrant, R. (2001). The moderating role of commitment on the spillover effect of marketing communications. *Journal of Marketing Research, 28,* 458-470.

Allison, R. I., & Uhl, K. (1964). Influence of beer brand identification on taste perception. *Journal of Marketing Research, 1,* 36-39.

Amar, M., Ariely, D., Bar-Hillel, M., Carmon, Z., & Ofir, C. (2011). *Brand names act like marketing placebos*. Retrieved from http://www.ratio.huji.ac.il/dp_files/dp566.pdf.

Ambler, T. (1992). *Need-to-Know-Marketing*. London, United Kingdom: Century Business.

American Marketing Association (AMA). (2013). Dictionary. Retrieved from http://www.marketingpower.com/_layouts/dictionary.aspx?dLetter=B.

Arcidiacono, P., Kinsler, J., & Price, J. (2013). *Productivity spillovers in team production: Evidence from professional basketball*. Retrieved from http://www.econ.iastate.edu/sites/default/files/draft090413_pa.pdf

Ariel, G., & Saville, W. (1972). Anabolic steroids: the physiological effects of placebos. *Medicine and Science in Sport and Exercise, 4,* 124-126.

Armin, F., & Ichino, A. (2006). Clean evidence on peer effects. *Journal of Labor Economics, 24*(1), 39–57.

Baddeley, M. (2010). *Herding, social influence and economic decision-making: Socio psychological and neuroscientific analyses.* Retrieved from http://rstb.royalsocietypublishing.org/content/365/1538/281.full.

Bandiera, O., Barankay, I., & Rasul, I. (2009). *Social incentives in the workplace*. Retrieved from http://ftp.iza.org/dp4190.pdf.

Beedie, C. (2007). Placebo effects in competitive sport: Qualitative data. *Journal of Sports Science and Medicine, 6,* 21-28.

Beedie, C., & Foad, A. (2009). The placebo effect in sports performance: A brief review. *Sports Medicine, 39*(4), 313-29.Beedie, C., Coleman, A., & Foad, J. (2007). Positive and negative placebo effects resulting from the deceptive administration of an ergogenic aid. *International Journal of Sport Nutrition Exercise and Metabolism 1*(7*),* 259-69.

Beedie, C., Stuart, M., Coleman, A., & Foad, J. (2006). Placebo effects of caffeine in cycling performance. *Medicine and Science in Sport and Exercise, 38,* 2159-2164.

Benedetti, F., Pollo, A., & Colloca, L. (2007). Opioid-mediated placebo responses boost pain endurance and physical performance: Is it doping in sport competitions? *J. Neurosa, 27*(44), 11934-11939.

Berns, G. (2005). Price, placebo, and the brain. *Journal of Marketing Research, 42*, 399–400.

Bradbury, C., & Drinen, D. (2008). Externalities in Major League Baseball. *Journal of Sports Economics, 9*(2), 211-224.

Bradley, J. C., Waliczek, T. M., & Zajicek, J. M. (1999). Relationship between environmental knowledge and environmental attitude of high school students. *Journal of Environtal Education, 30,* 17–21.

Buckman, R., & Sabbagh, K. (1993). *Magic or medicine: An investigation of healing and healers*. London, United Kingdom: Macmillan.

Burke, M., & Sass, T. (2008). Classroom peer effects and student achievement. *National Center for Analysis of Longitudinal Data in Educational Research.*

Chapman, K. Z., Dale, V. Q., Denes, A., Bennett, G., Rothwell, N. J., Allan, S. M., et al. (2009). A rapid and transient peripheral inflammatory response precedes brain inflammation after experimental stroke. *Journal of Cerebral Blood Flow and Metabolism, 29.*

Clark, V. R., Hopkins, W. G., Hawley, J. A., & Burke, L. M. (2000). Placebo effect of carbohydrate feeding during a 4-km cycling time trial. *Medicine and Science in Sport and Exercise, 32,* 1642-1647.

Crow, R., Gage, H., Hampson S., Hart, J., Kimber, A., & Thomas H. (1999). The role of expectancies in the placebo effect and their use in the delivery of health care: A systematic review. *Health Technology Assessment, 3,* 1–48.

Crum, J., & Langer, E. (2007). Mind-set matters: Exercise and the placebo effect. *Psychological Science, 18*(2), 165-171.

De Craen A. J., Kaptchuk, T. J., Tijssen, J. G., Kleijnen, J. (1999). Placebos and placebo effects in medicine: historical overview. *Journal of the Royal Society of Medicine, 92*, 511-515.

De Winter, J., & Dodou, D. (2010). The driver behavior questionnaire as a predictor of accidents: A meta-analysis. *Journal of Safety Research, 41*(6), 463-470.

EPMcom. (2012). *Tween sensibility, spending, & influence.* Retrieved from http://www.epmcom.com/products/item50.cfm.

Evans, D. (2003). *Placebo: The belief effect*. London, England: Harper Collins.

Ewald, J. & Moskowitz, H. (2007). The push–pull of marketing and advertising and the algebraof the consumer's mind. *Journal of Sensory Studies, 22*(2), 126-175.

Falk, A., & Ichino, A. (2006). Clean evidence on peer effects. *Journal of Labor Economics, 24*(1), 39-57.

Fletcher, J. (2010). Spillover effects of inclusion of classmates with emotional problems on test scores in early elementary school. *Journal of Policy Analysis and Management, 29*(1), 69-83.Foster, C., Felker, H., Porcari, J.P., Mikat, R.P., & Seebach, E. (2004). The placebo effect on exercise performance, *Medicine and Science in Sport and Exercise, 36*, Supplement S171.

Frazier, P., Baron, K., & Tix, A. (2004). Testing moderator and mediator effects in counseling psychology research. *Journal of Counseling Psychology, 51*(1), 115-134.

Freedman, S., Kearney, M., & Lederman, M. (2010). Product recalls, imperfect information, and spillover effects: Lessons from the consumer response to the 2007 toy recalls. Retrieved from https://www.econ.umd.edu/research/papers/570/download/307.

Geers, A., Weiland, P., Kosbab, K., Ladrey, S., & Hefer, S. (2005). Goal activation, expectation and the placebo effect. *Journal of Personality and Social Psychology, 89*(2), 143-159.

Gould, E. D., & Winter, E. (2009). Interactions between workers and the technology of production: Evidence from professional baseball. *The Review of Economics and Statistics, 91*(1), 188-200.

Guryan, J., Kroft, K., & Notowidigdo, M. (2009). Peer effects in the workplace: Evidence from random groupings in professional golf tournaments. *American Economic Journal: Applied Economics, 1*(4), 34-68.

Hamerman, E., & Johar, G. (2013). Conditioned superstition: Desire for control and consumer brand preferences. *Journal of Consumer Research. 40.*

Harrington, A. (1999). *The placebo effect: An interdisciplinary phenomenon.* Cambridge: Harvard University Press.

Hoch, S. J., & Ha, Y. (1986). Consumer learning: Advertising and the ambiguity of product experience. *Journal of Consumer Research, 13*, 221–233.

Hogg, M. K., Cox, A. J., & Keeling, K. (2000). The impact of self-monitoring on image congruence and product/brand evaluation. *European Journal of Marketing, 34*(5/6), 641-667.

Hong, S. J. (2011). *Spillovers in baseball: The effect of veteran presence on peer performance.* Retrieved from http://triceratops.brynmawr.edu/dspace/bitstream/handle/10066/6945/2011Hong pdf?sequence=5.

Idler, E., & Kasl, S. (1991). Health perceptions and survival: Do global evaluations of health status predict mortality? *Journals of Gerontology, 46*(2), S55–S65.

Irmak, C. (2007). *The placebo effect in marketing: Motivational underpinning*. Retrieved from http://proquest.umi.com/pqdlink?did=1409495511&Fmt=7&clientI d=79356&RQT=309&VName=PQD.

Irmak, C., Block, L., & Fitzsimons, G. (2005). The placebo effect in marketing: Sometimes you just have to want it to work. *Journal of Marketing Research, 42*, 406–409.

Jensen, P. & Karoly, P. (1991). Motivation and expectancy factors in symptom perception: a laboratory study of the placebo effect. *Psychosomatic Medicine, 53*, 144–152.

Kahneman, D. (2011). *Thinking, fast and slow*. New York, NY: Farrar, Straus and Giroux.

Kalasountas, V., Reed, J., & Fitzpatrick, J. (2007). The effect of placebo-induced changes in expectancies on maximal force production in college students. *Journal of Applied Sport Psychology, 19*(1), 116-24.

Kaptchuk, T. J., Kelley, J. M., Conboy, L. A., Davis, R. B., Kerr, C. E., Jacobson, E. E., (2008). Components of the placebo effect: a randomized con-trolled trial in irritable bowel syndrome. *British Medical Journal, 336*, 998-1003.

Kaplan, G. A., & Camacho, T. (1983). Perceived health and mortality: A nine-year follow-up of the Human Population Laboratory cohort. *American Journal of Epidemiology, 177*, 292–304.

Keller, K. L. (2003). Brand synthesis: The multidimensionality of brand knowledge. *Journal of Consumer Research, 29,* 595–600.

Kendall, T. (2003). Spillovers, complementarities, and sorting in labor markets with an application to professional sports. *Southern Economic Journal, 70*(2), 389 402.

Keynes, J. M. (1930). *In a treatise on money.* London, UK: Macmillan.

Kienle, G. S. & Kienle, H. (1996) Placebo effect and placebo concept: A critical methodological and conceptual analysis of reports on the magnitude of the placebo effect. *Alternative Therapies in Health and Medicine, 2*, 39–54.

Kirsch, I. (1985). Response expectancy as a determinant of experience andbehavior. *American Psychologist, 40,* 1189–1202.

Kirsch, I. (2004). Conditioning, expectancy, and the placebo effect: Comment on Stewart-Williams and Podd. *Psychological Bulletin, 130,* 341–3.

Kirsch I. (2013). The placebo effect revisited: Lessons learned to date. *Complementary Therapy in Medicine, 21*(2), 102-104.

Kleinman, A., Guess, H., & Wilentz, J. (2002). *An overview. In the science of the placebo: Toward an interdisciplinary research agenda.* (pp. 1–32). London United Kingdom: BMJ Books.

Kunda, Z., & Spencer, S. J. (2003). When do stereotypes come to mind and when do they color judgment: A goal-based theoretical framework for stereotype activation and application. *Psychological Bulletin, 129,* 522–544.

LaChance, J. J., Beaudoin, P., & Robitaille, J. (2003). Adolescents' brand sensitivity in apparel: Influence of three socialization agents. *International Journal of Consumer Studies, 27,* 47–57.

Loewenstein, G. F., Weber, E., Hsee, C., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin, 127,* 267-286.

Lundh, L.G. (2005). The role of acceptance and mindfulness in the treatment of insomnia. *Journal of Cognitive Psychotherapy: An International Quarterly, 19*(1).

MacInnis, D. J., & De Mello, G. E. (2005). The concept of hope and its relevance to product evaluation and choice. *Journal of Marketing, 69,* 1-14.

Maganaris, C. N., Collins, D., & Sharp, M. (2000). Expectancy effects and strength training: Do steroids make a difference? *The Sport Psychologist, 14,* 272-278.

Makens, J. C. (1965). Effect of brand preference upon consumers' perceived taste of

turkey meat. *Journal of Applied Psychology*, *49*(4), 261-263.

Mas, A., & Moretti, E. (2009): Peers at work. *American Economic Review, 99*(1),112-145.

McClure, S., Tomlin, L., Cypert, D., Montague K., & Montague, P. (2004). Neural correlates of behavioral preference for culturally familiar drinks. *Neuron, 44*, 379–387.

Moerman, D. (2002). *Meaning medicine and the 'placebo effect'*. Cambridge, United Kingdom: Cambridge University Press.

Montague, P. R., & Berns, G. S. (2002). Neural economics and the biological substrates of valuation. *Neuron, 36*(2), 265–84.

Ohinata, A., & Van Ours, J. (2012). Spillover effects of studying with immigrant students in the same classroom: Evidence from Quintile regression analysis. Retrieved from http://cream.conferenceservices.net/resources/952/3365/pdf/MGDNF2013_109pdf.

Olson, J., & Dover, P. (1978). Cognitive effects of deceptive advertising. *Journal of Marketing Research, 15*, 29-38.

Papps, K. L. (2008). The dynamics of productivity spillovers in Major League Baseball. (Doctoral dissertation), Cornell University.

Peck, C., & Coleman, G. (1991). Implications of placebo theory for clinical research and practice in pain management. *Theoretical Medicine, 12*, 247–270.

Ploghaus, A., Tracey, I., Gati, S., Clare, S., Menon, S., Matthews, M., & Rawlins, N. (1999). Dissociating pain from its anticipation in the human brain. *Science, 18*, 1979-1981.

Porcari J., & Foster C. (2006). Mind over body: ACE fitness Retrieved from http://www.acefitness.org/getfit/PlaceboStudy2006.pdf.

Price, D., & Barrell, J. (1984). Some general laws of human emotion: Interrelationships between intensities of desire, expectation, and emotional feeling. *Journal of Personality*, *52*, 389-409.

Price, D., & Fields, L. (1997). The contribution of desire and expectation to placeboanalgesia: Implications for new research strategies. In A. Harrington (Ed.), *The placebo effect: An interdisciplinary exploration* (pp. 93–116). Cambridge, MA: Harvard University Press.

Price, D., Chung, K., & Robinson, M. (2005). Conditioning, expectation, and desire for relief in placebo analgesia. Retrieved from http://www.somasimple.com/pdf_files/conditioning_placebo.pdf.

Price, D., Finniss, D., & Benedetti, F. (2008). A comprehensive review of the placebo effect: Recent advances and current thought. *Annual Review of Psychology, 59,* 565-590.

Price, D. D., Milling, L.S., Kirsch, I., Duff, A., Montgomery, G. H., & Nicholls. S. S. (1999). An analysis of factors that contribute to the magnitude of placebo analgesia in an experimental paradigm. *Pain, 83,* 147–156.

Punj, G., & Hillyer, C. (2004). A cognitive model of customer-based brand equity for frequently purchased products: Conceptual framework and empirical results. *Journal of Consumer Psychology, 14,*124-131.

Rao, R., & Monroe, B. (1989). The effect of price, brand name, and store name on buyers' perceptions of product quality: An integrative review. *Journal of Marketing Research, 26,* 351-357.

Reimann, M., Castaño, R., Zaichkowsky, J., & Bechara, A. (2012). How we relate to brands: Psychological and neurophysiological insights into consumer–brand relationships. *Journal of Consumer Psychology, 22,* 128–142.

Rescorla, R.A. & Wagner, A.R. (1972). A theory of Pavlovian conditioning: Variations in the effectiveness of reinforcement and nonreinforcement. In A. H. Black & W. F. Prokasy, (Eds.) Classical Conditioning II, (pp. 64–99). Appleton-Century-Crofts.

Rossman, G., Esparza, N., & Bonacich, P. (2010). I'd like to thank the academy, team spillovers, and network centrality. *American Sociological Review, 75*(1), 31-51.

Rudman, L., & *Borgida, E.* (1995). The afterglow of construct accessibility: the behavioral consequences of priming men to view women as sexual objects. *Journal of Experimental Social Psychology, 31*(6), 493–517.

Russell, J. A. (2003). Core affect and the psychological constriction of emotion. *Psychological Review, 110,* 145–172.

Rosenthal, R. (1994). Interpersonal expectancy effects: A 30-year perspective. *Current Directions in Psychological Science, 3,* 176-179.

Schonauer, K., & Denes, G. (1994). Graphemic Jargon: A case report. *Language, 47,* 279-299.

Scully, G. (1974). Pay and Performance in Major League Baseball. *American Economic Review, 65,* 915-930.

Shanks, C., Jacobson, H., & Kaplan, J. (1996). Inertia and change in the constellation of international governmental organizations, 1981-1992. *International Organization, 50*(4), 593-627.

Shaughnessy, J. J. (2006). *Research Methods in Psychology*. New York, NY: McGraw-Hill.

Shiv, B., Carmon, Z., & Ariely D. (2005a). Placebo effects of marketing actions: consumers may get what they pay for. *Journal of Marketing Research, 42*, 383-93.

Shiv, B., Carmon, Z., & Ariely, D. (2005b). Ruminating about placebo effects of marketing actions. *Journal of Marketing Research, 42*, 410-414.

Schmitt, B. (2012). The consumer psychology of brands. *Journal of Consumer Psychology, 22*, 7–17.

Smith, G. (2013). The Global Association of Marketing at Retail. *Tweens r' shoppers: A look at the tween market & shopping behavior*. Retrieved from http://www.popai.com/store/downloads/POPAIWhitePaper-Tweens-R-Shoppers 2013.pdf.

Stewart-Williams, S., & Podd, J. (2004). The placebo effect: Dissolving the expectancy versus conditioning debate. *Psychological Bulletin, 130*, 324-340.

Turner, J., Deyo, A., Loeser D., Von Korff M., & Fordyce E. (1994). The importance of placebo effects in pain treatment and research. *Journal of American Medical Association, 271*, 1609–1614.

Ulrich, R. S. (1984). View through a window may influence recovery from surgery. *Science, 224*, 420–421.

Vallance, A. (2006). Something out of nothing: The placebo effect. *Advances in Psychiatric Treatment, 12*, 287–296.

Waber, L., Shiv, B., Carmon Z., & Ariely D. (2008). Commercial features of placebo and therapeutic efficacy. *Journal of the American Medical Association, 299*(9), 1016 - 1017.

Wagner, T. (2005). The neural bases of placebo effects in pain. *Current Directions in Psychological Science, 14*(4), 175-179.

Wardle, J., & Solomons, W. (1994). Naughty but nice: A laboratory study of health information and food preferences in a community sample. *Health Psychology, 13*, 180–183.

Wegner, D., & Wheatley, T. (1999). Apparent mental causation: Sources of the experience of will. *American Psychologist, 54*(7), 480–92.

Whitmore, D. (2005). *Resource and peer impacts on girls' academic achievement: Evidence from a randomized experiment.* Retrieved from http://www.aeanet.org/annual_mtg_papers/2005/0108_1015_0301.pdf

Wilmert, N., Porcari, J., & Foster C. (2002). The effects of oxygenated water on exercise physiology during incremental exercise and recovery. *Journal of Exercise Physiology,* 5 (Pt 4).

Winickoff, R., Coltin, K., Morgan, M., Buxbaum, R. & Barnett, G. (1984). Improving physician performance through peer comparison feedback. *Medical Care, 22*(6), 527-534.

Wood, L. (2000). Brands and brand equity: Definition and management. *Management Decision, 38*(9), 662-669.

APPENDICES

Appendix A

Expectancy Questionnaire

Appendix A

Expectancy Questionnaire

Student #: _____

1. How likely is it that the Nike® Free Run 5.0 shoes you just learned about will deliver the performance it promised to?

    a. Not likely at all Very likely

    b. 1 2 3 4 5

2. How likely is it that the Nike® Free Run 5.0 shoes you just learned about will improve your running-speed if you were to wear it in the race?

    a. Not likely at all Very likely

    b. 1 2 3 4 5

Appendix B

Motivational Questionnaire

Appendix B

Motivational Survey

Student #: _____

1. How much would you like this pair of Nike® Free Run 5.0 shoes to improve your running speed?

   Not at all Very much

   1 2 3 4 5

2. How much would you like this pair of Nike® Free Run 5.0 shoes to help you win the race?

   Not at all Very much

   1 2 3 4 5

Appendix C

Running Time Summary Sheet Baseline + Test 1, Part I

Appendix C

Running Time Summary Sheet

Student #	**Baseline:** All run with own shoes	**Test 1, Part I:** All run with disguised brand

Appendix D

Running Time Summary Sheet – Test 1, Part II

Appendix D

Running Time Summary Sheet

Student #	**Type of Shoe** 1 = disguised 2 = branded	**Test 1, Part II:** • ½ run with disguised brand • ½ run with visible brand

Appendix E

Running Time Summary Sheet – Test 3

Appendix E

Running Time Summary Table

Student #	**Test #3:** 14-days later Own shoes

Appendix F

Promotional Information for Nike® Free 5.0 - Men

Appendix F

Promotional Information for Nike® Free 5.0 - Men

Natural barefoot-like feel

The Nike® Free 5.0+ Men's Running Shoe provides the foot strengthening benefits of natural motion, along with the cushioning, traction and underfoot protection of a traditional shoe.

Flexibility

The flex groove outsole-made up of deep cuts along the length and width of the midsole-enhances natural range of motion, encourages a smooth, efficient stride and helps maintain stability.

Low-Profile Feel

A low-profile midsole delivers a natural barefoot-like feel. It features the highest offset offered by Nike® Free running shoes, with an 8mm difference between heel and forefoot height for greater cushioning while still promoting a natural stride. Plus, the Phylite material in the midsole is tough enough to double as an outsole, dramatically reducing the shoe's overall weight.

Supportive Fit

The Nike® Free 5.0+ is the most supportive of the Nike® Free family thanks to ultra-light Flywire technology. This updated version of Flywire consists of soft yet durable cables that wrap the midfoot and arch from underneath the foot for a glove-like, supportive fit that adapts to your stride.

Appendix G

Promotional Information for Nike® Free 5.0 - Women

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Nike® Free 5.0 Women Running Shoe

The Nike® Free Run+: Barefoot-like feel, shoe-like benefits

The Nike® Free Run+ Women's Running Shoe was created for those who love the feel of barefoot running, yet need the cushioning, traction and protection of a shoe. This update to the Nike® Free series offers improved fit, cushioning and support.

Benefits: Inner-sleeve for a snug, barefoot-like fit

One-piece, patterned overlay for support and flexibility Flex grooves for flexibility and stability. Inner-sleeve, or bootie, conforms to your foot for a snug and comfortable, barefoot-like fit with or without socks. Extensive, breathable mesh on the upper enhances the barefoot-like fit and feel.

Flexibility

Deep Nike® Free flex grooves along the length and width of the midsole (which doubles as an outsole) allow your foot to move naturally while adding stability. The Nike® Free Run+ is even more flexible. A new heel design enhances cushioning when your foot first hits the ground, without compromising flexibility.