THE PLACEBO EFFECT IN MARKETING:

MOTIVATIONAL UNDERPINNINGS

by

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Abstract

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by

Caglar Irmak

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The purpose of this research is to investigate the underlying mechanism of the placebo effect, which is defined as a genuine physiological effect that 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 and Podd 2004). Much research demonstrated the role of expectations in the placebo effect (Kirsch 1997). Adding on the prior research, the first goal of the present research is to demonstrate the role of motivation in the placebo response. Second, as expectations were shown to be another important factor in producing the placebo effect, this research investigates the interactive effect of motivation and expectations to shed light into the process of the placebo response. Finally, it shows that marketing actions (e.g., couponing, branding) can increase individuals' motivation to consume a product and enhance consumer expectations about product effectiveness, which, in turn, lead to the placebo effect.

Three studies consistently show that motivation to experience the benefits of a consumed product is one of the most important factors in the placebo effect. The first study shows that consumers' desire to experience the benefits of an energy drink results

in increased blood pressure and task performance regardless of their expectations about experiencing product's benefits. The second study investigates the relationship between motivation and expectations by manipulating both of these factors and by collecting information-processing measures during consumers' exposure to the stimulus. Results show that the placebo effect can be observed when consumers have high product efficacy expectations and high motivation to experience the benefits of the consumed product. The third study lends further support that motivation is one of the key factors in the placebo response by manipulating motivation and expectations in different ways and showing the motivational nature of the process.

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CHAPTER 1: INTRODUCTION

"*The cure for the headache was a kind of leaf, which required to be accompanied by a charm, and if a person would repeat the charm at the same time that he used the cure, he would be made whole; but that without the charm the leaf would be of no avail.*"

– Socrates

"The fulfillment is always in the wish."

– Soeren Kierkegaard

Science has immensely developed for the last several centuries and explained many unexplainable phenomena in the world. Yet, there are few facts in the world upon which most scientists agree but cannot explain how and why. The placebo effect is one of them. Indeed, the placebo effect was noted as the single most complex behavioral phenomenon ever studied by psychologists and medical scientists (Fisher and Greenberg 1997). The main purpose of this dissertation is to shed light on the mechanism that leads to this phenomenon.

The term placebo comes from Latin, which means to please, to give pleasure, and to satisfy (Lewis 1953; Shapiro and Shapiro 1997). Recently, Stewart-Williams and Podd (2004) defined placebo as "a substance or procedure that has no inherent power to produce an effect that is sought or expected (p. 326)", and the placebo effect as "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 (p. 326)". In more colloquial terms, a placebo is essentially a "sugar pill" that a physician gives a patient, who was told that the pill is an effective drug. The placebo effect is the improvement in the patient's health condition after taking the pills. Such placebo effects have been observed in numerous medical settings, from relatively benign maladies such as warts and the common cold to more serious diseases as diabetes, angina and cancer (Kirsch 1997). Moreover, the placebo effect has been shown not only with substances, but also by a variety of procedures such as fake surgeries (Brody and Brody 2000), placebo acupunctures (Hrobjatrsson and Goetzsche 2001), and the use of switched-off machines (Ho et al. 1988). The effect has been also demonstrated by the use of non-human animals as subjects (Ader 1985; Ader and Cohen 1975).

Research on the placebo effect is not limited with the studies that use drugs or medical procedures. Studies with placebo coffee (Fillmore, Mulvihill, and Vogel-Sprott 1994; Fillmore and Vogel-Sprott 1992) and placebo alcohol (Fillmore et al. 1994) demonstrated the placebo effect by using consumer products as stimuli. Recent research in the marketing domain has shown the placebo effect with energy drinks (Irmak, Block, and Fitzsimons 2005; Shiv, Carmon, and Ariely 2005). These studies showed that a placebo drink (i.e., a brand placebo) is able to increase blood pressure and task performance of consumers who want to experience the benefits of the drink (Irmak, Block and Fitzsimons 2005) and that an energy drink with a discounted price (i.e., a price placebo) is not as effective in increasing consumers' task performance as an energy drink with full price (Shiv, Carmon, and Ariely 2005).

Having been demonstrated in multiple domains, the placebo effect presents an important research area for a variety of disciplines. In medicine, researchers suggest that the response to an active drug may be partly due to drug's inherent powers and partly due to a placebo effect (Stewart-Williams and Podd 2004). Thus, the healing power of *any* drug can be increased if the placebo effect is well understood. Moreover, placebos may be used in combination with active drugs in order to decrease the side effects of active medications (Stewart-Williams 2004). In psychology, the placebo effect is one of the clearest proofs of the effect of psychological mechanisms on physiological responses. As such, the questions about the mind-body connection have been asked since Plato, and investigated since the beginning of modern psychology (James 1890). For marketing and consumer research, the placebo effect provides a fascinating research area because the factors that underlie its mechanism – as shown by recent research – can be manipulated to result in better product performance and, hence, higher consumer satisfaction and loyalty.

Given the importance of this miraculous effect, much research has been conducted to explore the mechanism that underlies it (see Stewart-Williams and Podd 2004 for a review). To date, most of this research focused on the classical conditioning and expectancy views. According to the classical conditioning explanation, the repeated associations of the neutral stimuli in the situation (e.g., pill casings, syringes, doctors, hospital rooms) with the effect of active drugs (i.e., unconditioned stimulus, US) create a conditioned response (CR). Thus, an inert substance or procedure becomes a conditioned stimulus (CS) and leads to the placebo effect (Ader 1985; Voudouris, Peck, and Coleman 1985, 1989). According to the expectancy explanation, individuals' anticipations of the

treatment to be effective lead to the placebo effect (Bootzin 1985; Kirsch 1999; Peck and Coleman 1991). The most widely accepted theory among this stream of research is the response expectancy theory (Kirsch 1997) that suggests that expectancies directly (i.e., without mediation) shape the experiences and cause the placebo effect.

While prior research emphasized the role of classical conditioning and expectancies, little research focused on the motivational perspective of the placebo effect (Price and Fields 1997). Recently, suggesting a goal activation model of the placebo effect, Geers et al. (2005) showed that non-conscious activation of a goal that is compatible with the expectation leads to the placebo effect. Their research underscored the importance of motivation in the placebo response.

This dissertation research has several goals. First, it aims to demonstrate the role of motivation in the placebo response. Second, as expectations were shown to be another important factor in producing the placebo effect, this research investigates the interaction of motivation and expectations to shed light into the process of the placebo response. Finally, it focuses on marketing actions that can increase individuals' motivation to consume a product and enhance product efficacy expectations. Thus, my aim is to present a framework of the placebo effects of marketing actions that will guide practitioners who aspire to market better, more effective products and individuals who desire to have more out of the products they consume.

Next, I will provide the literature review on different perspectives on the placebo effect (i.e., classical conditioning, expectancy and motivational approaches). Then, I will present the perspective of the present research, develop my hypotheses and present the

results of three studies. Finally, I will discuss the implications of the findings and suggest directions for future research.

CHAPTER 2: LITERATURE REVIEW

In this section I will review three different perspectives on the placebo effect: Classical conditioning, expectancy and motivational approaches. The order of the presentation was deliberately chosen based on the fact that research on the placebo effect started with the classical conditioning studies, which were followed by research on expectations. Only recently, research on the placebo effect started investigating the effect of motivation in the placebo response.

The Classical Conditioning Approach to the Placebo Effect

The classical conditioning literature (Kamin 1968; Pavlov 1927; Rescorla and Wagner 1972) defines an active treatment such as an active drug as the unconditioned stimulus (US), the elements surrounding the active treatment (e.g., the materials used or the procedure followed to administer treatments) as the conditioned stimuli (CS), and the results brought about by the unconditioned stimulus as the unconditioned response (UR). Through repeated pairings of a neutral stimulus with a US, the neutral stimulus becomes a CS and it acquires the capacity to elicit a response similar or related to the UR. This response is known as the conditioned response (CR). One of the most well-known experiments that showed the effect of conditioning procedures on learning was conducted by Pavlov (1927). After repeated pairings of food administration and bell rings Pavlov's dogs started salivating solely by the ring of a bell.

According to the classical conditioning view of the placebo effect, the drug or active agent is the US, and the unlearned response to the active ingredient is the UR. During the course of the treatment of the US, the US is paired with neutral stimuli such as pill casings, syringes, hospital rooms, and interaction with the doctors. These stimuli are initially powerless in terms of eliciting the unconditioned effects of the active drug. But through repeated associations with the US, they become CSs, capable of eliciting an effect similar or related to that of the active drug. This effect is the CR. Thus, within the conditioning framework, a placebo is a CS, and a placebo effect a CR (Voudouris et al. 1985; Wickramasekera 1985).

Although some studies using the classical conditioning framework observed the placebo effect in humans (e.g., Flaten and Blumenthal 1999, Voudouris et al. 1985), most research with the classical conditioning approach to the placebo effect has been performed on nonhuman animals such as dogs, rats, and mice (Ader 1985; Herrnstein 1962; Pavlov 1927, Ross and Schnitzer 1963). For example, research conducted with rats demonstrated that saline that was paired with amphetamine produced similar effects to that produced by the amphetamine (Herrnstein 1962). Other research observed placebo analgesia (Fields and Price 1997), and drug-mimicking responses to anticholinergic drugs, insulin, and scopolamine hydrobromide in nonhuman animals (Voudouris et al. 1990).

In one of the most-cited research in support of the classical conditioning account of the placebo effect, Ader and Cohen (1975) administered rats a saccharine-flavored liquid with the immunosuppressant cyclophosphamide. After repeated pairings, injection of the saccharine solution by itself led to a decreased immune response in these animals (Ader and Cohen 1975). Ader and colleagues (Ader 1985; Ader and Cohen 1991) replicated these results by follow-up studies that are later demonstrated by other researchers as well (Ghanta, Hiramoto, Solvason, and Spector 1987; Krank and MacQueen 1988; McCoy, Roszman, Miller, Keely and Titus 1986). This stream of research is important not only because it demonstrated the placebo effect on the immune system for the first time, but also all the findings were in line with the classical conditioning framework. For example, just as the classical conditioning theory predicts a stronger US to produce a stronger CR, rats injected two doses of cyclophosphamide during the conditioning stage later exhibited greater conditioned immunosuppression

compared to those given only one dose. Moreover, the extent of immunosuppression depended on the schedule of reinforcement and the conditioned immunosuppression diminished in the absence of CS-US pairings.

The classical conditioning approach has a number of interesting implications to consumer and marketing research. First, loyal consumers of a product category may be conditioned by the elements that typically surround the purchasing and consumption experiences of that product category. For instance, a consumer who routinely buys coffee two times a day can be conditioned by not only the active ingredient – caffeine – of the coffee, but also by the timing of the coffee purchase (i.e., the time of the day), the smell of the coffee, the cup holder, or the way he/she sips the hot coffee from the cup. Second, not only the product category but a specific brand in a product category can condition the consumers by opening stores with the same layout, selling the product with the same package and using the same brand name, logo and slogan. By this token, the recent explosion of chain-stores like Starbucks can be viewed as conditioning procedures. As every active treatment considered having a placebo part (Stewart-Williams 2004), establishing this kind of franchising systems may be regarded as a promising marketing strategy from the point of a classical conditioning approach. Finally, as classical conditioning framework includes reinforcement as an important factor that strengthens the placebo effect, it can be claimed that products that are consumed by the loyal customers of a brand may perform better than those consumed by new customers just because of the reinforced associations of these “neutral conditioning procedures” with the unconditioned stimulus. Thus, recent corporate strategies emphasizing customer retention

– rather than customer acquisition – can also be justified by the classical conditioning perspective of the placebo effect.

Although classical conditioning presents a promising framework to explain the placebo effect, not all the placebo effects observed in the previous studies can be explained by this approach (Hrobjartsson 1996; Kirsch 1991, 1997). For example, classical conditioning cannot explain why prior experience with an active drug often does not increase placebo effects in humans (Rickels, Lipman and Raab 1966). Moreover, many studies have shown the placebo effect without conditioning procedures (e.g., Harrington 1997; Irmak, Block and Fitzsimons 2005, Montgomery and Kirsch 1996). Thus, starting from 1980's a more cognitive interpretation of the placebo effect has gained ground that suggests that expectancies mediate the effect of conditioning procedures on the placebo response (Kirsch 1991; Stewart-Williams and Podd 2004). According to Kirsch's (1985) response expectancy theory, classical conditioning is a special case of the expectancy view, where the organism – after repeated pairings of the active treatment with a placebo – acquires a placebo expectancy resulting in the placebo response. Almost all of the results of the prior placebo studies can be explained by this view, which will be discussed in the next section.

The Expectancy Approach to the Placebo Effect

Expectations are individuals' subjective probability assessments associated with future state of affairs (MacInnis and de Mello 2005; Olson, Roese, and Zanna 1996). The expectancy approach to the placebo effect suggests that the placebo effect is driven by anticipations that a treatment will result in a particular outcome (Bootzin 1985; Geers et al. 2005; Kirsch 1999). According to this view, placebo effects are one type of expectancy effects, and placebo administrations may be considered expectancy manipulations (Stewart-Williams and Podd 2004). Different from the classical conditioning approach that has been used to explain placebo effects in both humans and other animals, the expectancy approach has been applied almost exclusively to humans (Stewart-Williams and Podd 2004), mostly due to its cognitive approach to the placebo effect.

The expectancy perspective on the placebo effect has additional important implications on top of the classical conditioning approach because according to this view an individual is not required to go through a lengthy conditioning procedure to acquire the placebo expectancy. In other words, there are many ways to create expectancies in humans, classical conditioning being only one of them. One of these ways is advertising. Indeed, Walsh, Seidman, Sysko and Gould (2002) report a steady increase in response to both antidepressant medication and placebos in trials of antidepressant medication, which is at least partly attributed to consumers' increased beliefs in the efficacy of drugs brought about by heavy advertising strategies of pharmaceutical companies. The currently "advertised" biotechnology may have its own contribution to this trend. From a

services research point of view, beliefs in the efficacy of the drug are not only increased by advertising, but also by more intimate patient-physician interactions (Brody and Brody 2000) and the faith in the competence of the physicians. Thus, private doctors and hospitals who can manipulate the expectations of the patients by providing better services to the customers may also benefit from the placebo effect. One should note, however, that if the claims made for a placebo are too extreme, placebo effects may be less likely, as implausible claims are unlikely to influence expectancies (Kirsch and Weixel 1988). Another implication is that a drug or treatment that only relieves the symptom of a disease, but not cures it, can actually produce a placebo effect by increasing consumers' expectations about the drug's effectiveness. For example, a painkiller taken for flu can not only overcome the patient's fever but it can also cure the flu. Research on the negative placebo effect (Hahn 1997), however, demonstrates the other side of the coin. For example, drugs that communicate the possible side effects may actually increase the likelihood of the occurrence of these side effects. Similarly, diagnosis and prognosis can lead to increased symptoms of the "expected" disease, especially for those who have hypochondriacal tendencies (i.e., those who chronically fear of health problems) (Avia 1999, Barsky 1992).

Although expectancies appear to play a pivotal role in most placebo effects in humans, the mechanism by which expectancies lead to the placebo effect is not clearly determined (Stewart-Williams and Podd 2004). Some research proposes that expectancies act as a means to anxiety reduction (Lundh 2000), which then leads to improved immune system functioning (Turner et al. 1994). Other research suggests that placebo-induced expectations of analgesia may lead to decreased self-defeating thoughts and a greater

frequency of coping cognitions, and this in turn may decrease the experience of pain (Peck and Coleman 1991; Spanos, Perlini, and Robertson 1989). Besides emotional and cognitive explanations, placebos may promote changes in behavior, and the new behaviors directly influence health outcomes (Bootzin 1985; Turner et al. 1994). For example, placebo-induced expectations may lead patients with acute pain to resume a normal daily schedule, which, in turn, results in improved mood, changes the direction of attention and reduces the level of pain (Peck and Coleman 1991).

Although these explanations can account for some of the placebo effects observed in prior studies none can explain the placebo effects in healthy individuals or the negative placebo effects (Kirsch 1997). In an effort to integrate all the findings under a single expectancy theory Kirsch (1985, 1990) proposed the response expectancy theory. According to this theory, response expectancies are anticipations of the occurrence of nonvolitional responses such as emotional responses (e.g., fear, sadness), sexual arousal, and nausea. Response expectancies are considered the most important single factor both in the placebo effect and in hypnosis (Kirsch 1994) and are one of the factors leading to phobic, depressive and other psychological disorders (Kirsch 1990).

According to Kirsch's (1997) immediacy hypothesis, an expectation for a subjective experience leads directly to that subjective experience, without any intermediate causal links. For example, the expectation of depression directly causes depression, and the expectation of anxiety directly causes anxiety. Importantly, as a major limitation of the response expectancy theory, Kirsch (1997) notes that the immediacy hypothesis only applies to subjective experiences and their immediate physiological correlates (e.g., autonomic responses such as pulse rate and blood

pressure); for other objectively measurable placebo effects such as increased task performance after the consumption of a placebo energy drink, other variables may have to mediate the effects of expectancies. Indeed, some researchers suggested that expectation's effect on the placebo response may be mediated by factors such as attentional focus and causal attributions (Duncan and Laird 1980; Gibbons and Gaeddert 1984; Ross and Olson 1981).

In addition to the problems in determining the mechanism by which expectations produce the placebo effect, there are studies that show expectations do not lead to the placebo effect (e.g., Hammersley, Finnigan, and Millar 1998; Irmak, Block and Fitzsimons 2005; Jensen and Karoly 1991; Laska and Sunshine 1973; Walach, Schmidt, Dirhold, and Nosch 2002). Recently, in an attempt to overcome the limitations of prior theories on the placebo effect, Geers et al. (2005) proposed a motivational approach to the placebo effect. Next section will discuss the motivational approach to the placebo effect by focusing mainly on this research.

The Motivational Approach to the Placebo Effect

Motivation in the realm of the placebo effect is usually defined as one's desire to feel better or to feel reduced anxiety (e.g., Plotkin 1985; Price and Fields 1997; Price et al. 1999). This narrow definition of motivation, however, resulted in the unfortunate neglect of the motivational factors in the placebo response. Specifically, since there are studies and cases that show the negative effects of the placebo intake (the so called nocebo effect, Hahn 1997), researchers suggested that desire cannot be a factor underlying the placebo effect (Stewart-Williams 2004). However, goal theories have a much broader definition of motivation that encompasses proximal or lower order goals (e.g., increasing task performance, memorizing stimuli) and distal or higher order goals (e.g., establishing control, defending the ego) (Gollwitzer and Moskowitz 1996). According to Gollwitzer and Moskowitz (1996) "[distal] goals provide the individual with general direction and allow persistence in the face of obstacles to proximal goals (p. 379)". Importantly, Uleman and Moskowitz (1994) show that in the case of a conflict between proximal and distal goals, non-conscious activation of a distal goal can overwrite the proximal goal.

Although some researchers suggested that the placebo effect may be brought about by the participants' desire to cooperate with the experimenter or physician (Jospe 1978; Kienle and Kiene 1997; Margo 1999) or self-enhancement goals (Gibbons and Gaeddert 1984), few studies have been conducted using these broader definitions of motivation (Jensen and Karoly 1991; Geers et al. 2005). Recently, Geers et al. (2005) presented a goal-activation model of the placebo effect and demonstrated that non-

conscious activation of a cooperation goal (i.e., to cooperate with the experimenter) can lead to the placebo effect. By taking a self-regulatory approach (Baumeister and Vohs 2004; Cameron and Leventhal 2003), they proposed that expectations by themselves cannot lead to the placebo effect without an activated goal directing the cognitive processes.

Although Geers et al. (2005) eloquently showed the effect of non-conscious cooperation goals on the placebo response, unfortunately, their work has some important limitations. First, their findings can be considered as a result of a testing or demand effect, and testing effects are regarded as one of the most important drawbacks of experimental research (Churchill 1991). Second, considering that the results of many prior studies on the placebo effect – especially those conducted by the classical conditioning approach – are hard to be explained by the activation of a cooperation goal, a more comprehensive goal theoretic framework that includes goals other than the cooperation goal is needed. Thus, it is important to show that activation of different types of goals can lead to the placebo effect. Third, Geers et al. (2005) observe the placebo effect only in the high expectations – goal activation condition. Based on the results, they contend that the compatibility of the goal and the expectations leads to the placebo effect. They further note that a distal goal can either direct the information processing by making individuals selectively attend the available information or it can increase the suggestibility of the presented information (Kruglanski 1990; Kunda 1990; Darke and Chaiken 2005). Both of these explanations assume that motivation results in increased expectations, which then leads to the placebo effect. However, as Geers et al. (2005) did not manipulate the perceived efficacy of the placebo stimulus they were unable to collect

process measures that show that motivation leads to higher expectations. Considering that there is virtually no research on the placebo effect that shows processes such as motivated inference-making and/or information-processing, it is important to show whether these processes are actually at work as motivation and expectations are the two key factors leading to the placebo effect (Price and Field 1997). Importantly, if this kind of process is operant, then one would expect to observe the placebo effect only for those participants who have high motivation *and* high expectations about the effectiveness of the placebo treatment, however, contrary to this assumption, in one of the few studies that manipulated both expectations and motivation, Jensen and Karoly (1991) observed the placebo effect in the high motivation condition regardless of the level of expectations. Specifically, in their experiment, administration of placebo sedatives resulted in the placebo effect only for those participants who are in the high motivation condition. Motivation was manipulated by telling participants that individuals who react to the sedative pills have either positive or negative personality characteristics. However, as Jensen and Karoly (1991) did not measure objective placebo responses (i.e., the dependent variable was participant's self reports of sedation) it can be claimed that the results have been affected by the self-presentational biases of the participants (i.e., demand effect). Thus, the interaction of motivation and expectation warrants a more thorough investigation.

CHAPTER 3: THE PLACEBO EFFECT IN MARKETING

Much research in marketing showed that marketing actions such as branding, advertising and pricing can influence consumers' perceptions of product quality (Rao and Monroe 1989; Kirmani and Rao 2000). For example, consumers may believe that a product has higher quality if it is produced by a strong brand (Kirmani and Rao 2000), or if its price is higher than competitors' (Rao and Monroe 1989). Moreover, research showed that marketing actions can not only change consumers' perceptions of product quality, but also they can influence consumers' subjective sensations such as taste (Raghunathan, Naylor and Hoyer 2006). For instance, it has been shown that products of strong brands (e.g., Coke, Old Fashioned Seltzer) taste better when the labels of the brands were presented to the consumers (Makens 1965; McClure et al. 2004; Nevid 1981).

While such research showed the effect of marketing actions on subjective measures, recent research on the placebo effect (Shiv et al. 2005) demonstrated that marketing actions such as pricing and advertising can influence the actual effectiveness of a product (i.e., on objective measures). Specifically, Shiv et al. (2005) demonstrate that individuals who consume an energy drink, which was bought by the experimenter at a higher price, can perform better in a puzzle solving task than those who consume the same energy drink, which was bought at a discounted price. They explain these findings by the expectancy approach to the placebo effect, where consumers' price-quality inferences result in higher expectations about the drink's effectiveness when the price is high (vs. when it is low) and increase expectations, which, in turn, lead to the placebo

effect. Importantly, these inferences affect expectations in a non-conscious manner. When consumers deliberate on the price of the drink, the placebo effect vanishes. In addition to showing the effect of price in the placebo response, they also show that product efficacy claims can lead to the placebo effect (study 3). Specifically, when consumers are told that energy drinks strongly (vs. slightly) increase consumers' mental performance, participants' performance in the puzzle-solving task increases at a significant rate due to increased expectations in this condition.

The present research differs from Shiv et al. (2005) in two major ways. First, while Shiv et al. (2005) show that the effectiveness of an actual product (i.e., an energy drink) can change solely by its price and the strength of its claims (i.e., without changing the ingredients of the product), this research investigates the effectiveness of a brand that does not have any active ingredients to produce the effects it claims (i.e., brand placebo). Therefore, the main focus of the present research is on those factors that can turn an inert brand to an effective one. Second, the present research investigates the role of motivation, rather than expectations, in the placebo response. Recently, Geers et al. (2005) showed in a series of studies and across multiple symptom domains (e.g., music therapy, sleeping therapy) that non-conscious activation of a goal that is compatible with the expectations leads to the placebo effect. They explain the results by suggesting that "goals direct individuals to confirm a specific placebo expectation instead of a global reduction or increase in the amount of symptoms they perceive (p.145)".

While Geers et al. (2005) demonstrated that goals can increase the likelihood of the placebo effect they did not investigate the mechanism that goals work through, neither did they examine the effect of goals when individuals have low expectancy about

the effectiveness of the placebo stimulus. To explore the interaction of motivation and expectations in the placebo effect is theoretically important considering the vast amount of research on expectancy view of the placebo effect that neglect the effect of motivation. In particular, as Geers et al. (2005) also note, an activated goal can either direct the information processing by making individuals selectively attend the available information (Kunda 1990; Darke and Chaiken 2005), or it can increase the suggestibility of the presented information. Both of these explanations assume that motivation leads to increased expectations. However, another way to explain the effect of goals on the placebo effect is to consider the placebo effect as a result of a non-conscious motivational process (Bargh and Gollwitzer 1994; Chartrand and Bargh 1996; Sheeran 2001) that relies on automatic goal pursuit through pathways thinking or implementation intentions (Brandstatter, Lengfelder, and Gollwitzer 2001; Gollwitzer and Brandstatter 1997; Kruglanski et al. 2002; Oettingen and Gollwitzer 2002; Shah and Kruglanski 2003; Skinner 1996; Snyder 2000, 2002). Further, Sheeran (2001) shows that expectations do not affect the outcome, but the outcome is achieved automatically by implementation intentions. If the former explanation is valid, then one would expect to observe the placebo effect only for those participants who have high motivation *and* high expectations about the effectiveness of the placebo treatment, however, if the latter argument is correct, then the placebo effect should be observed even for those who have high motivation and low expectations.

Based on the latter explanation, I propose that consumption of an external substance that has no inherent power to help attaining the goal at hand acts as a pathway to the goal by automatically triggering goal-congruent actions and, hence, leads to the

placebo effect. According to this explanation, a placebo describes an outcome and acts as a means to that outcome. I designed three studies to explore this contention.

In the first study whose results were already published (Irmak, Block, and Fitzsimons 2005) we showed that consumers' desire to experience the benefits of an energy drink results in the placebo effect regardless of their expectations about experiencing product's benefits. In the second study, I investigate the relationship between motivation and expectations by manipulating both of these factors and by collecting information-processing measures during consumers' exposure to the stimulus. In the third study, I aim to show further support that motivation but not expectations is the key factor in the placebo response by manipulating motivation and expectations in different ways and showing the motivational nature of the process.

Similar to Geers et al. (2005), I take a self-regulatory approach to the placebo effect and propose a non-conscious motivational process (Bargh and Gollwitzer 1994; Chartrand and Bargh 1996). However, the main purpose of the present research is to explore the interaction of expectations and motivation and to examine the relative importance of these constructs in the placebo response. By doing this, I explore the effect of different levels of motivation and expectations on the placebo response to shed light on the underlying process of the placebo effect.

Definitions of the Placebo and Expectations

I believe that defining the key constructs is very important for every research because different researchers can only work on the same topic if they are clear about the

meanings of the key concepts they investigate. Definitions are especially important for the placebo research. Just to give you an idea about the importance of and confusion about the definitions of the key constructs in the placebo literature, for example, White, Tursky and Schwartz (1985) – a frequently cited book about the placebo effect – starts with a chapter on the definition of the placebo itself (Grunbaum 1985). This section is the longest chapter of the book (38 pages long), and although it gives a useful discussion about the different definitions of the placebo, it ends without a clear definition of the placebo (Brody 1985). In the beginning of this proposal I cited Stewart-Williams and Podd (2004) for their definition of the placebo as "a substance or procedure that has no inherent power to produce an effect that is sought or expected (p. 326)", however, given the confusion about definitions of the placebo and the context of this research (i.e., marketing) I will define the placebo based on the long discussion between Grunbaum (1985) and Brody (1985) as "a substance or procedure that claims to be powerful in producing a specific outcome, but which – unbeknownst to its consumer – has no inherent power to produce an effect that is sought or expected." This definition is more relevant for researching the placebo effect in the marketing context as consumers oftentimes are aware of what they consume and what the claims of the consumed brand/product are. In other words, the definition of the placebo in the marketing domain, i.e., a brand placebo, naturally should entail the claim of the placebo as the marketers' actions (e.g., advertisements) create consumer expectations. I also think that this definition overcomes Stewart-Williams and Podd's (2004) definition's drawback, which was also pointed by Kirsch (2004); that is, if the definition of the placebo does not include the claim of the placebo, then consumers will consider it an inert or irrelevant

substance; however, the powerful effect of this actually powerless substance comes from its “fake” claim, which is inherent to it.

As prior research on the placebo effect agrees on the importance of expectations in the placebo response, it is important to define expectations and make the distinction between expectations and outcomes in the placebo context. Expectations are subjective probability assessments about the attainability of a future outcome (MacInnis and de Mello 2005; Olson, Roese, and Zanna 1996). In the marketing context, all brands claim outcomes and create certain level of expectations regardless of their actual level of effectiveness. However, although an outcome is an end-state which can be defined objectively, expectancies are subjective in nature, which may differ depending on many factors such as the extremeness of the claimed outcome (i.e., product efficacy claims, Shiv et al. 2005), perceived self efficacy (Bandura 1977) and level of optimism/pessimism (Carver and Scheier 2000). As a result, research on the placebo effect in marketing should not investigate the conditions in which expectations do not exist, but it should investigate the conditions which alter the level of expectations. In other words, I suggest that it is not the *existence* of expectations but the *level* of expectations that is more important for understanding the mechanism of the placebo effect in marketing. Thus, research on the placebo effect in marketing should take into account not only the existence of these two factors (e.g., Geers et al. 2005), but also the levels of them.

The Relationship between Expectations and Motivation and a Means-End Approach to the Placebo Effect

Prior research on goals and self-regulation provides contradictory results about the relationship between motivation and expectations. On the one hand, there is research that supports the interdependence of motivation and expectations, suggesting the existence of motivated expectancies (e.g., Kruglanski 1990; Darke and Chaiken 2005; Snyder 1992); on the other hand, other research suggests that these constructs are independent from each other (e.g., Neuberg 1989; Skinner 1996; Snyder 2000, 2002). However, much research suggested that the level of motivation and expectations are influential in forming the subsequent behavior (e.g., Copeland 1993). Considering that motivation and expectations are the most influential two factors in the placebo response (Geers et al. 2005; Price and Fields 1997), the relationship between these two constructs and their effects on the placebo response deserves a thorough investigation.

Once a placebo is conceptualized as a claim for a specified outcome, the placebo expectancy can be manipulated by altering the strength of the placebo-claim. More importantly, when a placebo is conceptualized this way, it may be viewed as a pathway towards a specific outcome. Extant research on pathways thinking (Snyder 2000, 2002), means-end control theories (Aspinwall and Leaf 2002; Skinner 1996), implementation intentions (Brandstatter, Lengfelder and Gollwitzer 2001; Gollwitzer and Brandstatter 1997), and means-end theory of goal systems (Kruglanski et al. 2002; Shah and Kruglanski 2003) suggest that once a pathway to a desired end-state is formed, actions that are congruent with this end-state are automatically triggered (Chartrand and Cheng

2002). Based on this body of research I propose that a placebo acts as a pathway to a desired outcome and automatically activates goal-congruent actions leading to the placebo effect. This proposition suggests motivation as the most important factor in the placebo response.

On the other hand, I argue that expectations' role in a placebo study is to define the goal to be attained. In other words, the very act of suggestion; that is, describing the possible effect of a substance or a procedure (placebo), creates expectations and defines the goal related to the specific suggestion of the placebo[1]. However, once the goal is defined, and hence, the expectations are formed, the level of motivation may be more influential than the level of expectations in the placebo response. In other words, I attest that the *existence* of expectations is a must to observe the placebo effect, but the change in the *level* of expectations have a lesser impact on the placebo effect than the impact of the change in the level of motivation.

Support to this argument comes from prior research on self-regulation and perceived control. For example, it has been shown that the level of expectations about the attainability of a goal is not influential on the ability of pursuing goal-relevant actions for those who are capable of deriving pathways to desired goals and motivate themselves through agency thinking (Oettingen and Gollwitzer 2002; Snyder 2002). Similarly, research on implementation intentions defines implementation intentions as mental links (or pathways) "created between a specific future situation and the intended goal-directed response (Brandstatter, Lengfelder and Gollwitzer 2001, p. 946)". Moreover, with respect

[1] In light of this perspective, it is understandable why Geers et al. (2005) did not observe the placebo effect in the no expectation condition in their research. When individuals are not provided by any claim about the placebo (no expectation condition), the outcome is not defined. Moreover, considering that Geers et al. (2005) used the cooperation goal in their studies there is no possibility for the participants in the no-expectation condition to figure out for which outcome they need to cooperate with.

to the functional characteristics of implementation intentions, Gollwitzer (1993, p. 173) suggests a general principle called the “delegation of control to the environment” that is associated with features of automatic response (e.g., Bargh 1994, 1996, 1997; Logan 1992; Shiffrin and Schneider 1977). The present conceptualization of a placebo is similar to an implementation intention because just as implementation intentions create a pathway towards the goal-directed response so does a placebo.

Recent research on goal structures showed that means contribute to goal attainment by activating goal-directed actions (Kruglanski et al. 2002; Shah and Kruglanski 2003). For example, by priming individuals with the means of a specific goal Shah and Kruglanski (2003) show a “bottom-up” mechanism wherein the mere thought about the means brings the goal to the mind and increases the likelihood of continued goal-directed striving. If priming the means to attain a goal helps goal attainment, then mere consumption of an inert product (i.e., placebo) that primes the means to the goal can also trigger goal-directed actions.

Another support to this pathway explanation of the placebo effect comes from the perceived control literature. The experience of control is defined as “the extent to which an agent can intentionally produce desired outcomes and prevent undesired ones (Skinner 1996, p.551)”. Recent research and theorizing suggest that alternative agents, means, and ends can legitimately produce experiences of control and influence control perceptions. Hence, agents other than the self can be perceived as influencing outcomes, and if these agents are viewed as benevolent and acting on one's own behalf, they may augment or enhance personal control (Antonovsky 1979; Bandura 1993). A placebo, especially when

it is perceived to be effective, can form a pathway to the goal, and act as an agent to increase its consumers' sense of control (Brody and Brody 2001).

Based on the above discussion, I suggest that a placebo acts as an agent to assist its consumers by automatically increasing personal control, and directing physiological and physical behavior towards the achievement of the goal in a non-conscious manner (Bargh and Gollwitzer 1994; Chartrand and Bargh 1996). Importantly, this argument assumes that the pathway to a desired end-state can lead to goal-directed actions only if the pathway is perceived to be a reliable agent. Thus, not only the motivation to accomplish the goal but also the expectations about the effectiveness of the pathway that leads to the goal is important in the placebo effect. In other words, I suggest an additive effect of motivation and expectations on the placebo response such that the level of belief in the pathway (expectations) and the level of motivation to reach the end-state positively affect the likelihood of a placebo response. Formally, I hypothesize:

H1: A placebo product will lead to the same effect as the genuine product when consumers have high (vs. low) expectations about the efficacy of the consumed product and high (vs. low) motivation to experience the purported effects of the consumed product.

As discussed above, Shiv et al. (2005) demonstrate an increase in the effectiveness of an actual energy drink when consumers have high product efficacy expectations. By adding motivation into their framework, I hypothesize that a genuine product can show its claimed effects even under low expectations if the consumers have high motivation to experience the effects of the product. Formally, I hypothesize:

H2: A genuine product will lead to its claimed effects when either consumers' motivation or expectations or both are high; but it will not be effective when both consumers' motivation and expectations are low.

To investigate the validity of these hypotheses I have conducted three studies. A new brand of energy drinks – New York Minute – was used as the stimulus in these studies for two purposes. First, energy drinks provide a certain level of ambiguity in terms of the effectiveness of the product[2] so that we can achieve a reasonable spread in respondents' motivation to consume and expectations for the effectiveness of the product. Second, respondents were not familiar with the brand, which minimizes potential contamination of the results by either respondents' a priori experiences with or preferences for it.

The first study presented high-efficacy information about the brand and examined the effect of motivation on the placebo response when respondents have high expectations about the effectiveness of the product. The second study manipulated both motivation and expectations and investigated the interaction of these factors on the placebo response. Finally, the third study focused directly on a brand placebo by manipulating brand credibility and investigating its effect on expectations and the placebo response.

[2] http://www.bevnet.com/news/2006/10-27-2006-FDA_Functional.asp

STUDY 1

Overview

The main purpose of the first study is to investigate the effect of motivation on the placebo response when all participants receive high-efficacy information about the drink and test H1. Participants' motivation to experience the purported benefits (e.g., increased task performance and blood pressure) of a consumed energy drink and expectations about its effectiveness were measured in this study.

Method

Participants. One hundred and six undergraduate students participated in the study for partial fulfillment of course requirements. Participants were informed that they should not drink any caffeinated drinks for at least two hours prior to the experiment.

Design. The experiment utilized a 2 (Drink Consumed: Energy Drink vs. Placebo) x 2 (Motivation: High vs. Low, measured) between-subjects design with an additional control group.

Procedure. Participants were led to a private cubicle that contained a personal computer, alongside which was a pre-poured beverage. Participants were randomly assigned to one of three conditions: in the Energy Drink condition this beverage was an actual energy drink, New York Minute (active ingredient is caffeine[3]); in the Placebo condition the glass was filled with a diet decaffeinated beverage that was pre-tested to look and taste like New York Minute (Diet Dr. Brown); while in the Control condition,

[3] Smit and Rogers (2002) report that since little is known about the putative effects of taurine, it is reasonable to assume that the main effects of energy drinks should derive from their carbohydrate and/or caffeine content.

participant's glasses contained water. For both the Energy Drink and Placebo conditions, an empty can of New York Minute was placed beside the glass.

Participants in all conditions were informed that the purpose of the study was to evaluate an energy drink, and were instructed to consume the entire glass after completing some pre-consumption measures (both the Energy Drink and Placebo conditions groups were told the glass contained New York Minute). The session began with verbal instructions that the experimenter would measure subjects' blood pressure with an Omron HEM-609 electronic monitor that automatically inflates and measures diastolic and systolic blood pressures from the wrist. Blood pressure data was entered on each participant's computer after which they were told to continue answering questions on their computers, including an arousal measure, a test of physical reflexes and a mental alertness task.

After completing these pre-consumption measures, participants read information about the energy drink New York Minute, purportedly excerpted from the NY Times (see Appendix 1), answered questions about their motivation levels as well as expectations for the drink, and were instructed to drink the energy drink (or glass of water for the control participants) in its entirety. Following consumption of the drink, all participants completed an unrelated filler task for 25 minutes (a simple video game) to allow for sufficient absorption time (Kirsch and Weixel 1988, Alford, Cox and Wescott 2001). Upon concluding the filler task, the experimenter once again measured participants' blood pressure, and participants completed the same arousal measure, test of physical reflexes, and mental alertness tasks administered prior to consuming the drink. A series of self-reported arousal measures concluded the survey.

Measures.

Motivation. After Energy Drink and Placebo participants read the information about the energy drink but prior to consumption of the drink, they completed three motivation questions: "How much would you like New York Minute to increase your mental performance [physical] performance?" and "How much would you like to have the benefits of New York Minute?" on five-point scales anchored by "Not at all (1)/Very much (5)". These items were averaged (Cronbach's alpha = .87) and a median split was used to divide the Energy Drink and Placebo conditions into low and high motivation groups ($M_{high\text{-}motivation} = 4.83$, $M_{low\text{-}motivation} = 3.65$).

Expectations. To assess participant expectations, four items were completed just before the consumption of the beverage: "How likely is it that New York Minute will, in general, have the effects it claims to?" and "How likely is it that New York Minute will increase your mental performance [physical performance//blood pressure] if you were to drink it now?" Items were measured using five point scales with anchors "Very Unlikely (1)/Very Likely (5)" and were averaged to provide an overall expectations index (Cronbach's alpha = .77). As expected, the mean of expectations were relatively high (M = 3.76).

Arousal. Participants twice completed a subset of Thayer's (1989) arousal scale, once prior to consumption and once approximately 30 minutes after consumption of the beverage. Items included the subject's feelings of how energetic, lively, sleepy, tired, and quiet (the latter three were reversed scored) they felt on a four point scale labeled "definitely/slightly/cannot decide/definitely do not".

Test of physical reflexes. Participants were asked to hold down the space bar until they received computer driven instructions to release it and press a specified key on the keyboard as quickly as possible. The time between stimulus exposure and key pressing time was recorded. Participants were asked to do this task consecutively for ten different randomly presented keys, and completed the task twice, once before and once after consuming the drink. The first two key strokes, which were considered as the warm-up session, were eliminated and the time to press the rest of the keys was averaged to assess the performance in the reflex task.

Mental alertness. Wechsler's (1958) Digit Span Test was used to assess participants' mental alertness level. They were provided a series of numbers on the computer screen. Each number was shown for approximately half a second on the screen and participants were asked to reproduce the digits immediately after exposure precisely in the order they had seen them on the screen (forward span test). The number of digits presented started at five and increased up to eight (in total they were exposed to eight different number sequences). Next, participants were shown another series of numbers in the same way as the forward span test, but this time they were asked to reproduce the digits backward (backward span test). Since the backward span test is inherently more difficult, the number of digits started from four and increased up to six, and in total respondents were exposed to six different number sequences. The performance in this task was measured in two ways. First, participants' responses were compared with the correct response. If the response is identical with the number to be remembered they received one point, if not they received zero point. The total points they collected was used as the one of the performance measures in the mental alertness task. Second, the

time to enter each response was measured by the computer. The average time to enter the response was used as the second performance measure in the mental alertness task. As with the arousal and physical reflex measures, mental alertness was measured both before and after the participants consumed the beverage and the first two responses were eliminated from the assessment.

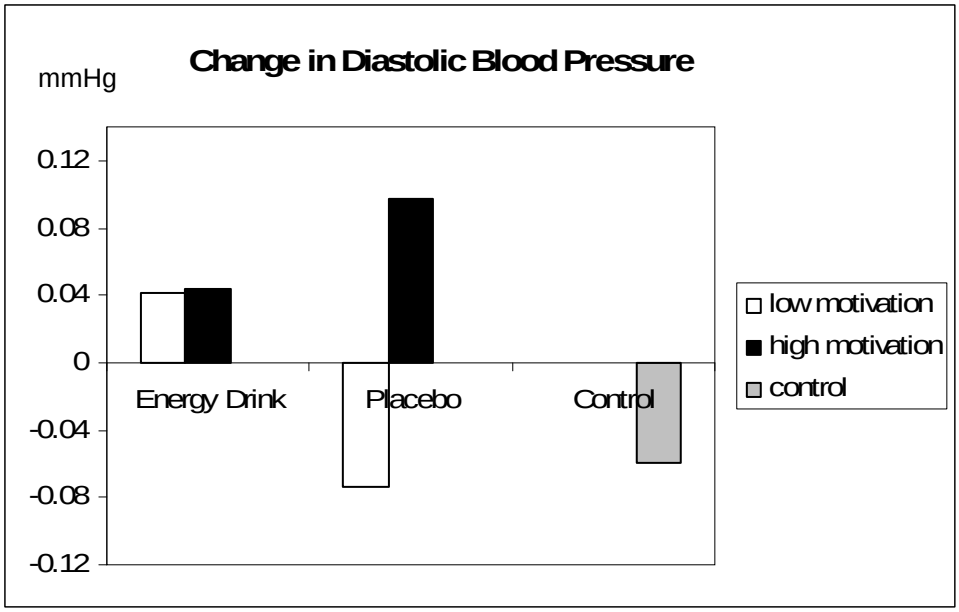
Results

Thirteen participants were unable to consume the beverage and complete the study for a variety of health reasons (e.g., baseline systolic blood pressure above 160; baseline diastolic blood pressure below 60). The analysis was performed on the remaining 93 participants, of which 66 participants were in the treatment conditions (either Energy Drink or Placebo) and 27 participants were in the Control condition.

Results that reached significant levels across the five objective measures of physiological change and the subjective self-report of arousal are presented in Table 1. I ran two basic analyses for each dependent measure. The first was a 2 (Drink Consumed: Energy Drink vs. Placebo) x 2 (Motivation: High vs. Low) ANOVA with Expectations as a covariate in the analysis. Expectations did not interact with either Drink Consumed or Motivation, but did account for significant error variance in several cases so was included as a covariate in each ANOVA. In addition, for each dependent variable I ran a series of planned contrasts between each of the four treatment conditions and the hanging control (Energy Drink/High Motivation, Energy Drink/Low Motivation, Placebo/High Motivation, Placebo/Low Motivation, and Control). As the pattern replicates across the

dependent variables I will discuss only the diastolic blood pressure analyses in depth (see Figure 1).

Figure 1: Placebo Effect on Diastolic Blood Pressure (Study 1)



As I hypothesized, motivation played a key role in changing response to a brand placebo at a physiological level when respondents were presented with high-efficacy information about the brand. A significant 2-way interaction between Drink Consumed and Motivation was observed ($F(1, 62)=4.49$, $p<.05$). This interaction can be best interpreted by examining the mean change in diastolic blood pressure for the four treatment conditions versus control[4]. When participants consumed an actual energy drink we observed a significant increase in their diastolic blood pressure versus the control

[4] Results do not change meaningfully if the data are analyzed using blood pressure after beverage consumption as the dependent variable and blood pressure prior to beverage consumption as a covariate in the analyses, and similarly no meaningful changes are observed for parallel analyses on the other dependent variables.

group that consumed water regardless of their motivation level. Participants in the Energy Drink/High Motivation condition had a mean change in diastolic pressure of 0.04 mmHg (log normalized) and participants in the Energy Drink/Low Motivation condition had a mean change of 0.04 mmHg versus control participants (-0.06 mmHg, $F(1, 91)=5.39$, $p<.05$ and $F(1,91)=4.10$, $p<.05$ respectively). By contrast, participants in the Placebo conditions had very different results by motivation level. Participants in the Placebo/Low Motivation Condition (mean change = -0.07 mmHg) were no different from control participants (-0.06 mmHg, $F(1, 91)=0.09$, $p=.77$). Participants in the Placebo/High Motivation Condition (mean change = 0.09 mmHg) showed significantly greater increases in diastolic blood pressure than did control (-0.06 mmHg, $F(1, 91)=9.61$, $p<.01$) and, while directionally higher, were not statistically separable from either Energy Drink motivation condition (both p's greater than .30). This pattern of results holds for systolic blood pressure, physical reflex tasks, mental alertness and subjective arousal (see Table 1).

Table 1: Placebo Effects on Measures of Energy Change (Study 1)

	Energy drink / high motivation	Energy drink / low motivation	Placebo / high motivation	Placebo / low motivation	Control
Diastolic Blood Pressure:	0.044[a]	0.041[a]	0.097[a]	-0.074[b]	-0.06[b]
Systolic Blood Pressure:	0.017[a]	0.016[a]	0.035[a]	-0.021[ab]	-0.048[b]
Improvement in Pressing Time	462[cd]	1127[c]	1233[c]	478[cd]	304[d]
Improvement in Entering Time (forward span):	432[cd]	1259[cd]	1377[c]	816[cd]	404[d]
Improvement in Entering Time (backward span):	498[ab]	1020[a]	651[ab]	201[b]	300[b]
Change in Self-reported arousal	0.46[c]	0.45[cd]	0.52[c]	0.07[d]	-0.04[d]

a and b significantly different from each other at $p<0.05$ (two-tailed test)
c and d significantly different from each other at $p<0.10$ (two-tailed test)
ab, cd not significantly different from other conditions.

Blood Pressures: mmHg (log-normalized)

Improvement in pressing time, entering time: ms (millisecond)

Self-reported Arousal: 1-4 point scale

Discussion

The results of the first study lend support to my basic hypothesis that motivation, but not expectations is influential in creating a placebo effect when consumers were presented with high-efficacy information about the consumed product. Even after controlling for the effect of expectations the results still show a significant placebo effect based on motivation. Although I did not manipulate expectations in this study, one can argue that all participants were in the high expectations condition because of the high efficacy information provided about the energy drink. To investigate the placebo effect when individuals have low expectations about the effectiveness of the drink, the next

study manipulates expectations by providing low and high efficacy information about the drink.

Prior research (Geers et al. 2005) suggests that those who are motivated to experience the benefits of the placebo may selectively process information that supports the effectiveness of the placebo, and hence, may build higher expectations, which, in turn, leads to the placebo effect. As I did not collect information-processing measures in the first study, I cannot know how motivation affects participants' information-processing. To overcome this limitation and explore the effect of motivation on information-processing and expectations, the next study collects measures of information-processing.

STUDY 2

Overview

The second study has several goals. First, I explore the effect of motivation both in the low and high expectancy conditions by manipulating both motivation and expectations and test H1 and H2. Second, in order to explore the relationship between motivation and expectations I collect process measures such as the type of additional information (i.e., in praise of New York Minute or criticism of New York Minute) that participants choose to receive about the drink they will be consuming, and the time they spend on reading different sections of the information presented about the stimulus. Finally, I aim to replicate the results of the first study in the high expectations condition.

Method

Participants. One hundred and sixty-four Baruch College undergraduate students participated in the study either for partial fulfillment of course requirements or in exchange of $10. Participants are informed that they should not drink any caffeinated drinks for at least two hours prior to the experiment.

Design. The experiment utilized a 2 (Drink Consumed: Energy Drink vs. Placebo) x 2 (Motivation: High vs. Low) x 2 (Expectations: High vs. Low) between-subjects design with an additional control group.

Procedure. The procedure of the second study was similar to that of the first study except the following. First, both motivation and expectations were manipulated, rather than measured. Second, additional measures of information processing were gathered.

Motivation manipulation: Approximately half of the participants, who were randomly assigned to the high motivation condition, were presented an envelope containing a gift certificate from Baruch College Marketing Department for their participation in the study. The gift certificate granted a free six-pack of the energy drink to these participants (see Appendix). Participants signed their gift certificates, and were told that they can redeem the gift certificate in several supermarkets in New York City.

There are several reasons for this manipulation to increase the motivation level of the participants. First, the gift certificate creates a mere ownership effect that leads to a self-enhancement bias toward the energy drink that is about to be consumed (Beggan 1992; Sen and Johnson 1997). Second, based on research on promotions (Duncan 2004), those who received gift certificates before consuming the drink were expected to be more motivated for the drink to work than those who did not receive the gift certificate as these participants have the opportunity to freely consume the drink in the future. Participants also responded to motivation manipulation check items (the same questions asked in study 1, but with a 7-point scale instead of a 5-point scale; Cronbach's alpha = .89) before the expectations manipulation was carried out.

Expectations manipulation: After pre-consumption measures were collected, all participants read an article about the energy drink, New York Minute, purportedly excerpted from the NY Times. In the high expectations condition, the article contained

high efficacy information about the energy drink such as “New York Minute has been shown to increase task performance of 90% of its consumers”, and in the low expectations condition, participants were led to believe that New York Minute is not as effective as other brands on the market (see Appendix 2). Before the consumption of the drink, but after the collection of additional measures of information processing, which are discussed next, participants responded to expectations manipulation check items (the same questions asked in study 1, this time with a 7-point scale instead of a 5-point scale; Cronbach’s alpha = .84).

Additional measures of information processing: Immediately after the expectations manipulation, all participants were instructed that they will be presented with additional information about energy drinks. Additional information was provided in a website format so that participants can click on different buttons on the screen to receive more information about New York Minute. The first page provided general information about energy drinks and New York Minute to let participants click on two different buttons (i.e., “In praise of New York Minute” or “Criticism of New York Minute”) to receive more information about New York Minute. Participants’ choice of first clicks and time spent on different pages on the site were recorded by the computer in order to examine whether motivation and/or expectations lead them to receive positive or negative information about the energy drink. The information on these pages was irrelevant to the efficacy of the energy drink (e.g., taste, packaging, promotional and channel strategy of New York Minute, see Appendix 3) so that the expectations manipulation was not affected but the change in information-processing can be detected.

Results

Five participants were unable to consume the beverage and complete the study for a variety of health reasons (e.g., baseline systolic blood pressure above 160; baseline diastolic blood pressure below 60). The analysis was performed on the remaining 159 participants, of which 120 participants were in the treatment conditions (either Energy Drink or Placebo) and 39 participants were in the Control condition.

Before testing my predictions I conducted ANOVAs with Drink Consumed, Expectations and Motivation as the independent variables and the manipulation checks of Expectations and Motivation as the dependent variables to assess the success of the experimental manipulations. The effect of the expectations manipulation on its manipulation check was significant ($F(1,119) = 8.50$, $p < .01$) and in the expected direction ($M_{high\text{-}exp} = 4.61$, $M_{low\text{-}exp} = 4.06$). The effect of motivation manipulation on its manipulation check, however, was not significant ($F(1,119) = 1.70$, $p = .19$), though was in the expected direction ($M_{high\text{-}mot} = 5.62$, $M_{low\text{-}mot} = 5.32$). There was, however, an unexpected significant interaction effect of Expectations and Motivation ($F(1,119) = 4.18$, $p < .05$) such that motivation manipulation significantly increased participants' motivation only in the high expectations condition ($M_{high\text{-}mot} = 5.98$, $M_{low\text{-}mot} = 5.10$, $p < .05$), but it did not significantly change level of motivation in the low expectations condition ($M_{high\text{-}mot} = 5.29$, $M_{low\text{-}mot} = 5.50$, $p > .50$). In addition, there was a substantial level of correlation between motivation and expectations measures ($r = .36$, $p < .0001$). Although motivation manipulation did not have a significant effect on its manipulation check in the low expectations condition, based on prior research that suggests coupons'

effect on unconscious motivation (Oliver, Shor and Tidd 2004), participants who received the gift certificates may be considered to be motivated in a non-conscious manner.

Similar to study 1, I ran two basic analyses for each dependent measure. First, I conducted a 2 (Drink Consumed: Energy Drink vs. Placebo) x 2 (Motivation: High vs. Low) x 2 (Expectations: High vs. Low) ANOVA. Second, for each dependent variable I ran a series of planned contrasts between each of the eight treatment conditions and the hanging control. Results that reached significance (three objective measures of physiological change) are presented in Table 2.

Table 2: Placebo Effects on Measures of Energy Change (Study 2)

High Expectations Condition:

	Energy drink / high motivation	Energy drink / low motivation	Placebo / high motivation	Placebo / low motivation	Control
Diastolic Blood Pressure:	0.10^{a}	0.094^{a}	0.044^{a}	-0.027^{ab}	-0.077^{b}
Systolic Blood Pressure:	0.017^{ab}	0.036^{ab}	0.081^{a}	-0.029^{ab}	-0.10^{b}
Improvement in Reflex Task	535^{b}	698^{b}	2279^{a}	530^{b}	557^{b}

Low Expectations Condition:

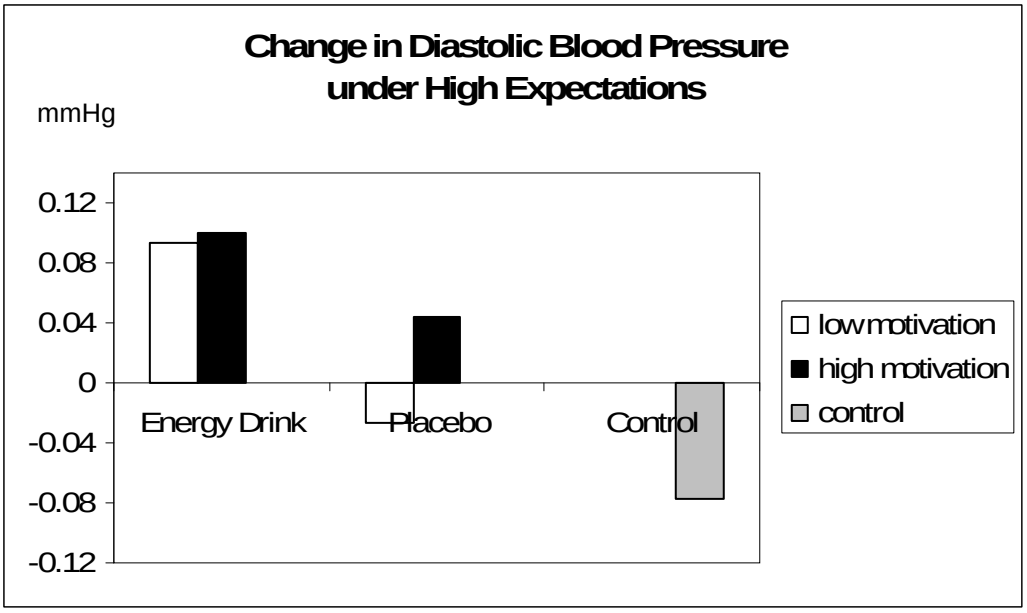
	Energy drink / high motivation	Energy drink / low motivation	Placebo / high motivation	Placebo / low motivation	Control
Diastolic Blood Pressure:	0.073^{a}	-0.01^{ab}	-0.022^{ab}	0.092^{ab}	-0.077^{b}
Systolic Blood Pressure:	-0.011^{a}	-0.071^{ab}	-0.063^{ab}	0.064^{a}	-0.10^{b}
Improvement in Reflex Task	923^{ab}	516^{b}	374^{b}	1629^{a}	557^{b}

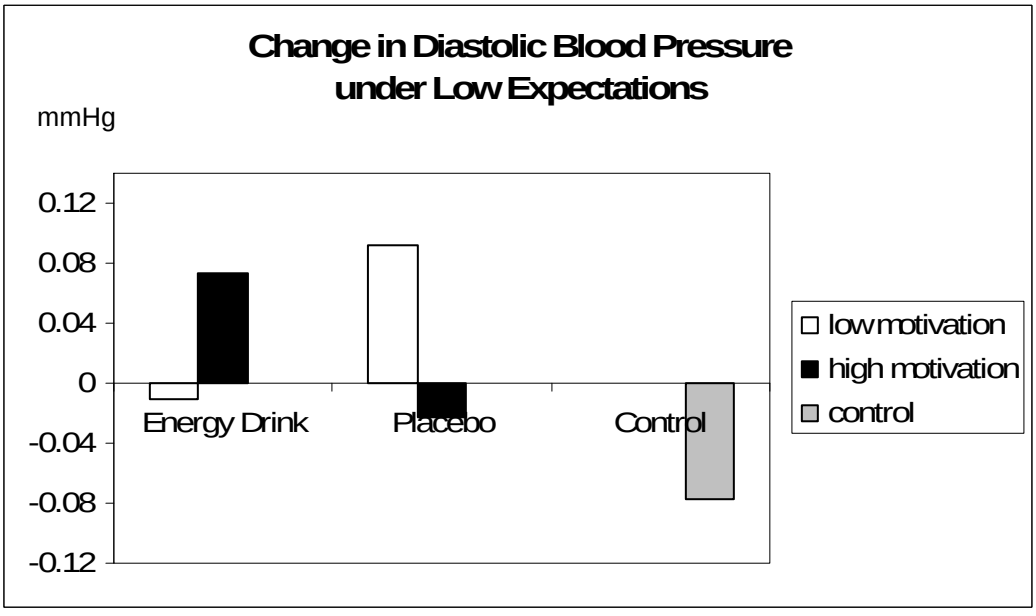
a and b significantly different from each other at $p<0.05$ (two-tailed test)
ab not significantly different from either a or b
Blood Pressures: mmHg (log-normalized)
Improvement in pressing time, entering time: ms (millisecond)

As expected, motivation and expectations played a key role in changing response to a brand placebo at a physiological level. A significant three-way interaction effect of Drink Consumed, Motivation and Expectations was observed on diastolic blood pressure[5] ($F(1,119) = 2.84$, $p < .10$), systolic blood pressure ($F(1,119) = 3.57$, $p = .05$) and performance in the reflex task ($F(1,119) = 4.94$, $p < .05$), which showed the same pattern. This interaction can be best interpreted by examining the mean change in diastolic blood pressure for the eight treatment conditions versus control (see Figure 2).

[5] Weight of the participants was used as a covariate in the analysis of diastolic blood pressure as it was significant at $p < .0001$ level.

Figure 2: Placebo Effect on Diastolic Blood Pressure (Study 2)





In the high expectations condition, when participants consumed an actual energy drink I observed a significant increase in their diastolic blood pressure versus the control

group that consumed water regardless of their motivation level. Participants in the Energy Drink/High Expectations/High Motivation condition had a mean change in diastolic pressure of 0.10 mmHg (log normalized) and participants in the Energy Drink/High Expectations/Low Motivation condition had a mean change of 0.09 mmHg versus control participants (-0.08 mmHg, $F(1,53) = 6.32$, $p<.05$ and $F(1,46) = 4.33$, $p < .05$, respectively). By contrast, participants in the Placebo/High Expectations/Low Motivation Condition (mean change = -0.03 mmHg) were no different from control participants (-0.08 mmHg, $F(1, 91) = 0.57$, $p = .45$); whereas participants in the Placebo/High Expectations/High Motivation Condition (mean change = 0.04 mmHg) showed significantly greater increase in diastolic blood pressure than did control (-0.08 mmHg, $F(1, 49) = 5.47$, $p <. 05$) and, were not statistically separable from either Energy Drink conditions reported above (both p values greater than .25).

In the low expectations condition, when participants consumed an actual energy drink there was a significant increase in their diastolic blood pressure versus the control group only in the High Motivation condition. Specifically, participants in the Energy Drink/Low Expectations/Low Motivation condition showed no significant change in diastolic blood pressure (mean change = -0.01 mmHg) compared to control participants (-0.08 mmHg, $F(1,48) = .72$, $p > .35$); whereas participants in the Energy Drink/Low Expectations/High Motivation condition had a significant increase in their diastolic blood pressure (mean change = 0.07 mmHg) versus control participants ($F(1,52) = 4.11$, $p < .05$). By contrast, participants in the Placebo/Low Expectations/High Motivation Condition (mean change = -0.02 mmHg) were no different from control participants ($F(1,52) = 0.41$, $p > .50$); and participants in the Placebo/Low Expectations/Low

Motivation Condition (mean change = 0.09 mmHg) showed marginally significant increase in diastolic blood pressure compared to control participants ($F(1, 52) = 2.44$, $p = . 12$).

Finally, I have conducted ANOVAs with the independent variables on the additional information processing measures (the choice of the first click, time spent on additional information and time spent on different parts of the additional information) to investigate the interaction of expectations and motivation. There was no significant effect of independent variables on these measures.[6].

Discussion

The results of study 2 lend support to H1 and H2. In line with H1 and replicating study 1, the placebo effect was observed in the high expectations and high motivation condition. Specifically, those who consumed the placebo drink experienced higher blood pressure and performed better in the tasks when they were motivated to experience the effects of the drink. In other words, the placebo drink was as powerful as a real energy drink when consumers' expectations and motivation were high. Consistent with H2, results in the low expectations condition did not show a placebo effect; however, the real energy drink increased participants' blood pressure and task performance in the high motivation condition.

These results indicate two important findings. First, effectiveness of a product with potent ingredients can decrease if the consumers have low expectations about the

[6] Only fifty-nine participants clicked on either button to receive additional information and those who chose to receive more information were evenly distributed across conditions.

efficacy of the product; however, this decrease in effectiveness can be avoided by marketing activities such as sampling or couponing, which potentially increase individuals' motivation to experience the benefits of the product. Second, consumption of a placebo product, of which ingredients have no inherent power to produce the claimed effect, can lead to real physiological effects only if the consumers' expectations *and* motivation are high.

In the next study, I aim to replicate the effects found in the second study by manipulating motivation and expectations in different ways. Specifically, I will use a conventional motivation manipulation in the next study, where participants will be given an incentive to perform better in the tasks. Expectations, on the other hand, will be manipulated by providing different information about the brand of the energy drink consumed. Essentially, the next study investigates the effect of brand credibility on expectations and explores the answer to this question: "Does a strong brand perform better just because of the strength of the brand?". In other words, I suggest that products of strong brands may perform better not only because of their high-quality ingredients but also because of the strength of their brand name.

STUDY 3

Method

Participants. One hundred and forty-three Baruch College undergraduate students participated in the study in partial fulfillment of course requirements. Participants are informed that they should not drink any caffeinated drinks for at least two hours prior to the experiment.

Procedure. The procedure of the study was similar to the second study except the following. First, as New York Minute, the energy drink used in the first study was discontinued at the time of the study, I used Red Bull in the Energy Drink condition. Participants were still presented with New York Minute cans on their desk, but in the Energy Drink condition they consumed Red Bull instead of New York Minute. Second, in line with study objectives, I used different types of motivation and expectations manipulations (described below). The order of these manipulations was counterbalanced. Thus, the experiment utilized a 2 (Drink Consumed: Energy Drink vs. Placebo) x 2 (Motivation: High vs. Low) x 2 (Expectations: High vs. Low) x 2 (Order: Motivation manipulation first / Expectations manipulation first) between-subjects design with an additional control group. Because the expectations manipulation contained two different brands, additional measures of information processing were not collected in this study.

Motivation manipulation: After the pre-consumption measures were completed, all participants were informed by the computer that they will be performing the tasks again after consuming the drink. At this point, approximately half of the participants, who

were randomly assigned to the high motivation condition, were also presented with reward information. Specifically, these participants were told that the computer will record their performance and if they perform in the top twenty-five percentile they will receive $20 cash reward in the end of the experiment[7]. In fact, performance information was not attained at the individual level, so all the participants (including those in the low motivation condition) were paid $2 in the end of the experiment.

Expectations manipulation: Before consuming the drink, all participants read an article about the energy drink, New York Minute, purportedly excerpted from the NY Times. In the high expectations condition, the article told that New York Minute was produced by Red Bull in order to target people with metropolitan lifestyle; whereas in the low expectations condition participants were led to believe that New York Minute was produced by Battery Inc.[8] (see Appendix 4). These brands were chosen based on two pretests.

First pretest (n = 28) measured credibility of these two brands along with two other brands (Pepsi and RC Cola). Specifically, participants were shown four brands (the order of presentation was counterbalanced and had no significant effect on the results) and responded to brand awareness ("Have you heard of Red Bull energy drink before? Yes / No) and prior consumption (Have you consumed Red Bull energy drink before? Yes / No) questions and seven-item five-point brand credibility scale (Erdem, Swait and Valenzuela 2006), which included items such as "Red Bull has the ability to deliver what it promises", "Red Bull has a name you can trust" (1 = Strongly disagree, 5 = Strongly

[7] Participants were told that the network computer will indicate only the number of the terminal the participant sitting at in order to preserve anonymity of other responses.

[8] Battery is an energy drink brand produced by Oy Sinebrychoff Ab, a Finland based company.

agree). Brand credibility items were averaged to form a composite measure of Brand Credibility for all brands (Cronbach's alpha = .93 and .94 for Red Bull and Battery, respectively). Results showed that Red Bull's brand credibility was significantly higher (M = 3.47) than that of Battery (M = 2.60, $p < .0001$), and although all of the participants heard of Red Bull and 68% consumed it before, only one out of twenty-eight participants heard of Battery and none of the participants consumed it before.

Second pretest (n = 52) investigated whether the information that New York Minute was produced by these two different brands (i.e., Red Bull and Battery) can manipulate product efficacy expectations of the participants. Specifically, participants were shown these two brands one by one (the order of presentation was counterbalanced and had no significant effect on the results) and told that New York Minute, a new energy drink targeting people in metropolitan areas, is produced by Red Bull or Battery. Then, they have responded to expectations and motivation manipulation check items of the main study. The results showed that when New York Minute is produced by Red Bull product efficacy expectations were higher (M = 4.54) than when it is produced by Battery (M = 3.31, $p < .01$). As expected, motivation showed no significant difference across conditions ($M_{redbull} = 3.64$, $M_{battery} = 3.36$, $p > .30$).

Results

Six participants were unable to consume the beverage and complete the study for a variety of health reasons (e.g., baseline systolic blood pressure above 160; baseline diastolic blood pressure below 60) or due to computer malfunctions. The analysis was

performed on the remaining 138 participants, of which 124 participants were in the treatment conditions (either Energy Drink or Placebo) and 14 participants were in the Control condition.

Before testing my predictions I conducted ANOVAs with Consumed Drink, Expectations, Motivation and Order as the independent variables and the manipulation checks of Expectations and Motivation as the dependent variables to assess the success of the experimental manipulations. The effect of the motivation manipulation on its manipulation check was significant ($F(1,123) = 4.58$, $p < .05$) and in the expected direction ($M_{high\text{-}mot} = 5.75$, $M_{low\text{-}mot} = 5.17$). The effect of expectations manipulation on its manipulation check, however, was not significant ($F(1,123) = 1.08$, $p = .30$, $M_{high\text{-}exp} = 3.88$, $M_{low\text{-}exp} = 4.05$).

Although the expectations manipulation was not successful, I first conducted a 2 (Drink Consumed) x 2 (Motivation) x 2 (Expectations) x 2 (Order) ANOVA on each dependent variable. Results showed a significant two-way interaction effect of Drink Consumed and Motivation on mental alertness task ($F(1,123) = 4.62$, $p < .05$) such that when participants consumed an actual energy drink their performance in the mental alertness task significantly improved in the High Motivation condition (mean change = 0.10) compared to that of in the Low Motivation condition (mean change = -0.02, $p < .05$); whereas when they consumed the placebo drink, there was no significant difference in participants' performance across two levels of motivation (mean change in the low motivation condition = 0.05, mean change in the high motivation condition = 0.00, $p > .30$). The same pattern of interaction of Drink Consumed and Motivation was observed

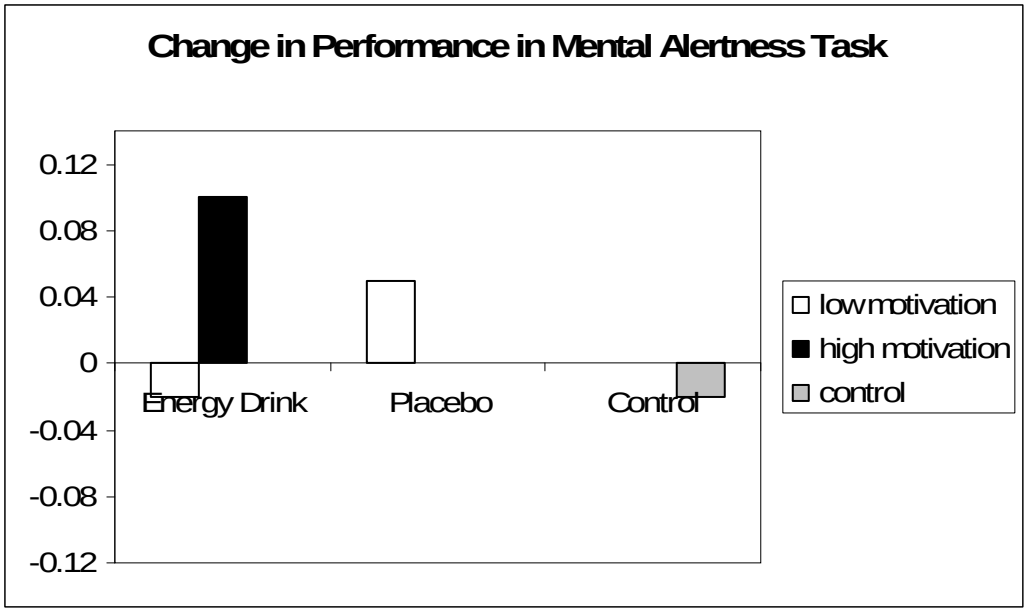
on diastolic blood pressure ($F(1,123) = 2.15$, $p = .15$) and change in feelings of arousal ($F(1,123) = 2.06$, $p = .15$), though the effects did not reach significance (see Table 3).

Table 3: Placebo Effects on Measures of Energy Change (Study 3)

	Energy drink / high motivation	Energy drink / low motivation	Placebo / high motivation	Placebo / low motivation	Control
Diastolic Blood Pressure	0.041	- 0.025	- 0.012	0.027	- 0.048
Improvement in Mental Alertness Task	0.10	- 0.02	0.00	0.05	- 0.02
Change in Self-reported arousal	.50	.32	.25	.43	.11

Next, I conducted simple contrasts to investigate the mean change in the performance in mental alertness task for the four treatment conditions (Energy Drink/High Motivation, Energy Drink/Low Motivation, Placebo Drink/High Motivation, Placebo Drink/Low Motivation) versus control. Results showed a marginally significant difference between Energy Drink/High Motivation and Energy Drink/Low Motivation conditions ($F(1,56) = 2.92$, $p < .10$) and between Energy Drink/High Motivation and Control conditions ($M_{energy/high\text{-}mot} = 0.10$, $M_{control} = -0.02$, $F(1,39) = 2.06$, $p = .15$). All other pair-wise differences were non-significant (p values > .20, see Figure 3).

Figure 3: Placebo Effect on Mental Alertness Task (Study 3)



Discussion

The results of this study can be interpreted based on the fact that the expectations manipulation was not successful. As the mean values of expectations were very similar to those in the low expectations condition of the second study, the results may be interpreted as if all measures were collected under low expectations. If this interpretation is used, the results are consistent with those of study 2. Specifically, similar to the second study, when consumers' expectations were low, the actual energy drink increased consumers' blood pressure and task performance only when consumers were motivated to experience the benefits of the drink, and the placebo drink did not produce significant change in any of the measures.

CHAPTER 4: CONCLUSIONS

The present research investigated the two most important factors in the placebo response: Expectations and motivation. Consistent with recent research on the placebo effect (Geers et al. 2005), findings demonstrated the effect of both expectations and motivation on the placebo response. Specifically, three studies documented that in order the placebo effect to be observed, consumers should have both high expectations about the efficacy of the placebo and high motivation to experience the purported benefits of the placebo. Importantly, a real product (i.e., Red Bull, an actual energy drink) did not show its claimed benefits when consumers were not motivated to experience its effects and when they did not believe in the efficacy of the product.

Theoretical Contributions

The results of this research have important theoretical contributions to research in marketing. Essentially, these findings fundamentally change the way we think about products. At a fundamental level, individuals consume products for the sensational experience they bring to their lives. In essence, the active ingredients of the products define the quality of the product, which is one of the major elements of the product core (Armstrong and Kotler 2007). If the desired sensations can be brought about by consuming any product (i.e., regardless of the ingredients of the product) that is well advertised and promoted (i.e., builds expectations and motivation), then the core of a product should not only contain product's ingredients but also the marketing activities that surround the product (i.e., other marketing mix elements such as promotion, pricing

and distribution). In other words, the 4 Ps of marketing may not be as independent from each other as we thought before.

The present research has several contributions to research on the placebo effect documented in medicine. First, it presents one of the first studies that demonstrates the effect of motivation on the placebo response. Second, it provides evidence that both expectations and motivation are important factors in the placebo response. Importantly, it proposes an additive function of these factors such that the greatest placebo effect is observed when both expectations and motivation of the consumers are at relatively higher levels.

Considering the findings from the expectations-satisfaction model (Oliver 1980) point of view, it is interesting that higher expectations lead to higher product performance in the case of a real energy drink, but that this increase in product performance does not reflect itself on the likelihood of purchasing/consuming the product in the future. These results suggest that expectations, at least in the energy drink product category, can increase the actual effectiveness of the product without affecting the satisfaction level. In essence, consumers who expect more from a product can get what they expect just because of their expectations; however, ironically, higher level of expectations may prevent higher levels of satisfaction and repeat purchase as expectations-satisfaction model predicts.

The present research also provides important implications for motivational theories such as the self efficacy theory (Bandura 1977). According to the self-efficacy theory, if individuals believe they can achieve a desired outcome from their actions, they are more motivated to act and persist on their actions when they face difficulties. In the

context of this research, while consuming an energy drink may indirectly increase individuals' perceived self efficacy in performing the assigned tasks, it may also make the individuals rely too much on the energy drink and not put enough effort to improve their task performance. Indeed, although I observed significant differences across different groups of participants who consumed the real or placebo drink based on their expectations and/or motivation, these individuals rarely performed better than those in the control group when they consumed the actual energy drink. Findings suggest that individuals do not need to consume performance enhancing products in order to increase their performance. Believing in once capabilities and not relying on external factors may be sufficient.

Practical Implications

The present research has important practical implications. First, if motivation and expectations of the consumers can make an inert product have the same effects produced by a real product with active ingredients, then marketers should invest more in promotion, place and pricing activities that increase consumers' expectations and motivation, rather than putting emphasis on product development. As such, this research provided evidence that promotion tools such as couponing do not only motivate consumers to buy the promoted brand, but also they can increase the quality of the brand (i.e., increase the effectiveness of the product). Moreover, loyal consumers of a brand may be more likely to be affected by the placebo effect not only because of the conditioning effect of repeated consumption, but also because these consumers may be

extending themselves to their favorite brands and as a result, are more motivated for these brands to perform better.

From the consumers' point of view, the findings of this research suggests that consumers should consume products when they really desire and expect to experience the products' effects in order to increase the actual effectiveness of the products. The best time to consume a product may be the moment of actual need for the product. Also, consumers should keep in mind that doubt in the effectiveness of the product may be self-fulfilling (i.e., low expectations about a product's effectiveness may actually turn the product to an ineffective product).

Considering the yet incurable diseases and the placebo procedures being used for helping the patients suffering from such diseases, demonstrating motivation as one of the most important factors in the placebo response has important practical implications in the medical domain. Specifically, the present research suggests that physicians should not only try to boost patients' expectations about the effectiveness of the medications, but also make them motivated for experiencing the effects of the medications.

Limitations and Directions for Future Research

This research has several limitations that I aim to address in future studies. First, because only one type of stimulus (i.e., energy drinks) was used in all studies, it is crucial to demonstrate the effects observed in this research with other product categories in order to increase the external validity of the findings. Thus, future research should investigate the placebo effect with products other than energy drinks. For example, energy gums or

bracelets on the market can be used in future experiments to investigate the placebo effect in new product categories.

Another important limitation of this research is that although the pretest results in study 3 assured a successful expectations manipulation, I did not observe a significant effect of manipulation of expectations in study 3 on their manipulation checks. Future studies should manipulate expectations in cleaner and stronger ways. Successful manipulation of motivation and expectations will help clarify both the interaction of these factors and their effects on the dependent variables.

APPENDIX 1: Stimulus Used in Study 1

Energy Drinks are the Fastest Growing Category in the Beverage Business

February 4, 2005

Once the province of young extreme athletes and the nightclub crowd, energy drinks have gone mainstream. Sleepy college students drink it because they like the buzz; weekend athletes vouch for the energy lift.

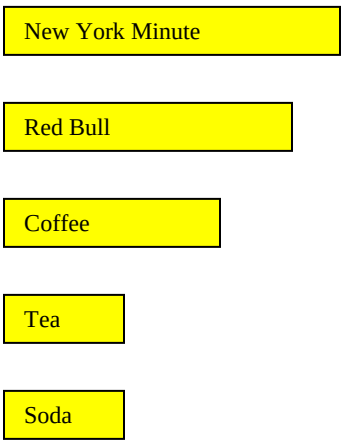
The best energy drink out there? A recent study by the Institute of Sports rated our own city's beverage -- New York Minute – the best performance-enhancing drink on the market.

For mental alertness, fast responses, and better performance on mental tasks -- New York Minute surpassed all other brands.

Unlike competitive drinks on the market, New York Minute provides the energy without the highs and lows of a sugar buzz.

Instead, New York Minute contains healthful additives, like taurine and vitamin B in the form of niacin, pantothenic acid and pyridoxine hydrochloride (B6). Taurine, which the body produces on its own, is found in high concentrations in the heart. Taurine is lost during high stress and physical exertion. A 2001 study from the European journal Amino Acids noted an increase in the amount of blood, oxygen and nutrients that the heart can pump to the working muscles among a group of athletes who drank energy drinks, like New York Minute, with taurine.

In addition, caffeine can be ergogenic – a fancy word for performance enhancing – because it perks up the central nervous system, and that becomes increasingly important as mental and physical exertion increases.



Source: Institute of Sports

APPENDIX 2: Stimuli Used in Study 2

Low Expectations Condition:

The following is excerpted from the *New York Times*

Energy Drinks are the Fastest Growing Category in the Beverage Business

November 21, 2005

Once the province of young extreme athletes and the nightclub crowd, energy drinks have gone mainstream. Sleepy college students drink it because they like the buzz; weekend athletes vouch for the energy lift.

The best energy drink out there? A recent study by the Institute of Sports rated Red Bull the best performance-enhancing drink on the market.

For mental alertness, fast responses, increased blood pressure and better performance on mental tasks New York Minute – our own city's beverage –showed a below-average performance compared to other brands. 35% of its consumers have reported to experience the benefits that are claimed by New York Minute.

Performance Enhancement: 8 oz. serving

- Red Bull
- RockStar
- New York Minute
- SoBe
- Crunk

Source: Institute of Sports

High Expectations Condition:

The following is excerpted from the *New York Times*

Energy Drinks are the Fastest Growing Category in the Beverage Business

November 21, 2005

Once the province of young extreme athletes and the nightclub crowd, energy drinks have gone mainstream. Sleepy college students drink it because they like the buzz; weekend athletes vouch for the energy lift.

The best energy drink out there? A recent study by the Institute of Sports rated New York Minute – our own city's beverage – the best performance-enhancing drink on the market.

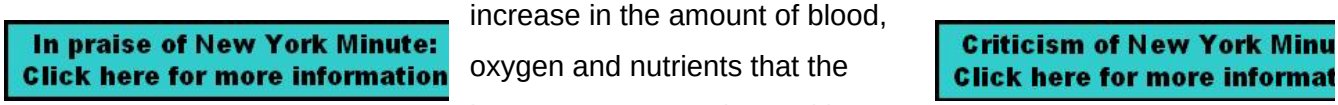
For mental alertness, fast responses, increased blood pressure and better performance on mental tasks New York Minute surpassed all other brands. 95% of its consumers have reported that they experienced the benefits that are claimed by New York Minute.

Performance Enhancement: 8 oz. serving

- New York Minute
- Red Bull
- RockStar
- SoBe
- Crunk

Source: Institute of Sports

APPENDIX 3: Additional Information Provided in Study 2



Energy drinks contain healthful additives, like taurine and vitamin B in the form of niacin, pantothenic acid and pyridoxine hydrochloride (B6). Taurine, which the body produces on its own, is found in high concentrations in the heart. Taurine is lost during high stress and physical exertion. A 2001 study from the European Journal of Amino Acids noted an increase in the amount of blood, oxygen and nutrients that the heart can pump to the working muscles among a group of athletes who drank energy drinks, like New York Minute, with taurine.

In addition, caffeine can be ergogenic – a fancy word for performance enhancing – because it perks up the central nervous system, and that becomes increasingly important as mental and physical exertion increases. Click on the links to get more information about New

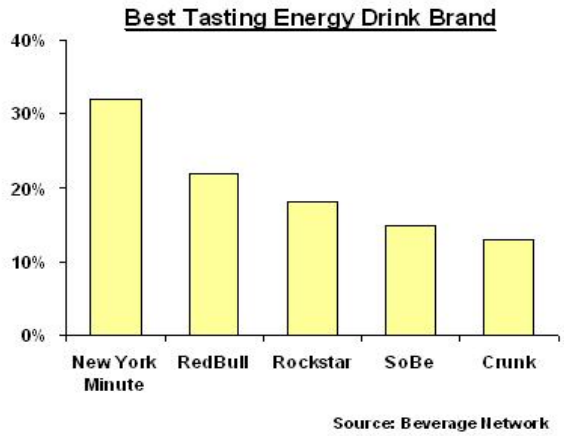
In Praise of New York Minute:

Unlike competitive drinks on the market, New York Minute combines the energy boost with great flavor.

Taste of New York Minute: Click here for more informatio

In addition to being surprised by its pleasant taste, consumers like the simple package of New York Minute. Click on the links to get more information about taste and packaging of New York Minute.

Packaging of New York Minut Click here for more informatio

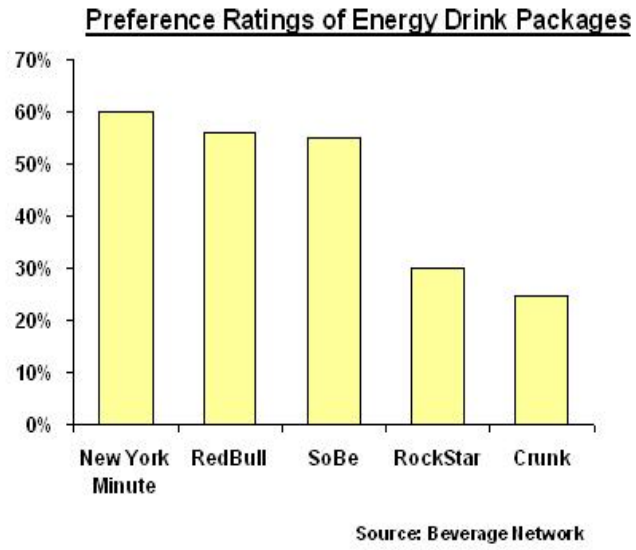


The best tasting energy drink out there?

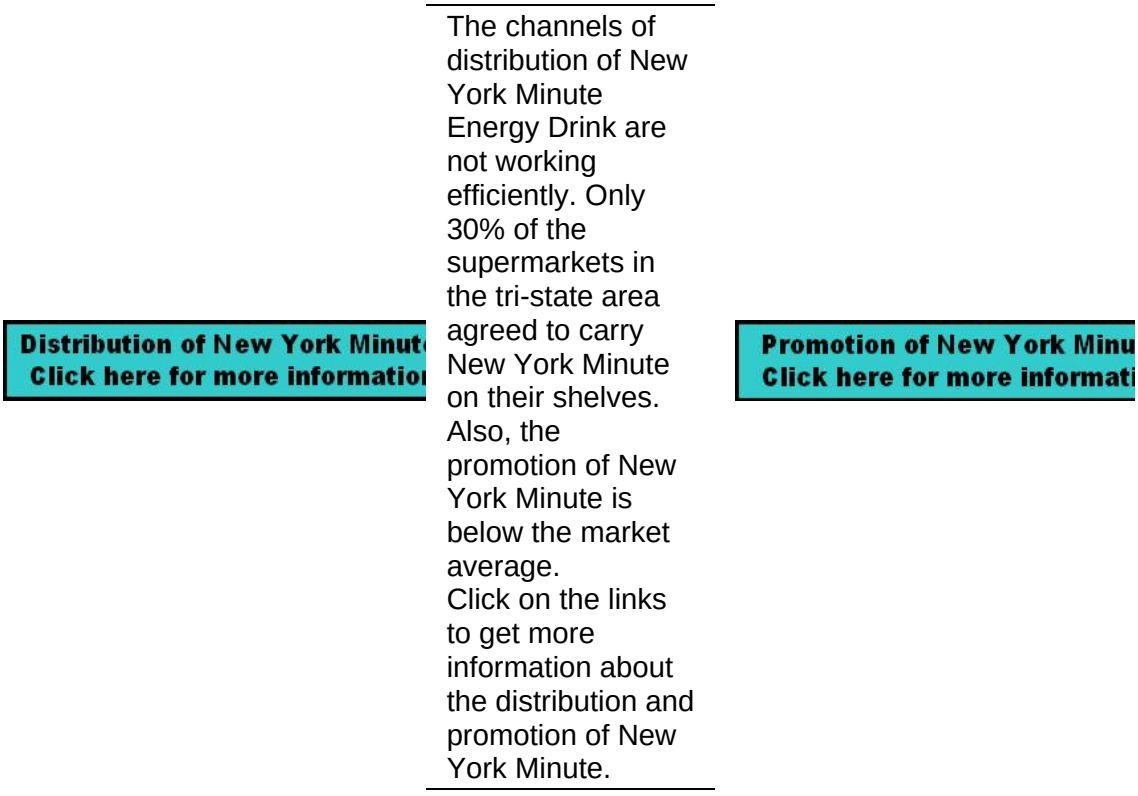
A recent study by the Beverage Network rated New York Minute as the best tasting energy drink on the market. The study conducted with about 200 consumers residing in the tri-state area showed that consumers' first preference in terms of taste is New York Minute (see chart on the left).

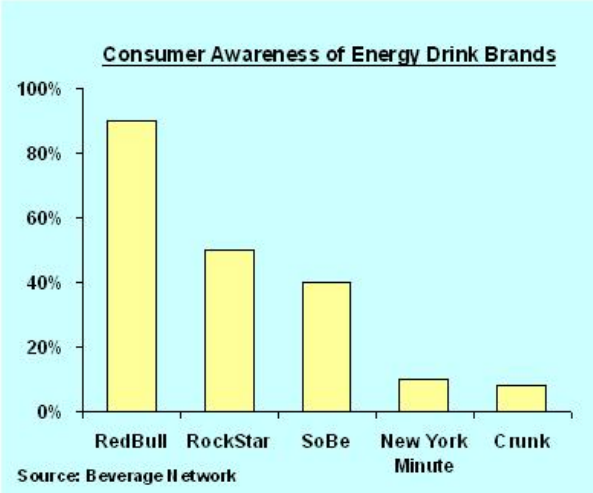
Which energy brand's package is preferred the most?

According to a recent study conducted by the Beverage Network, New York Minute's package is preferred the most among the energy drink brands on the market (see chart on the left). About 200 consumers, who reside in the tri-state area, participated in the study and more than half of them stated that they liked the package of New York Minute.



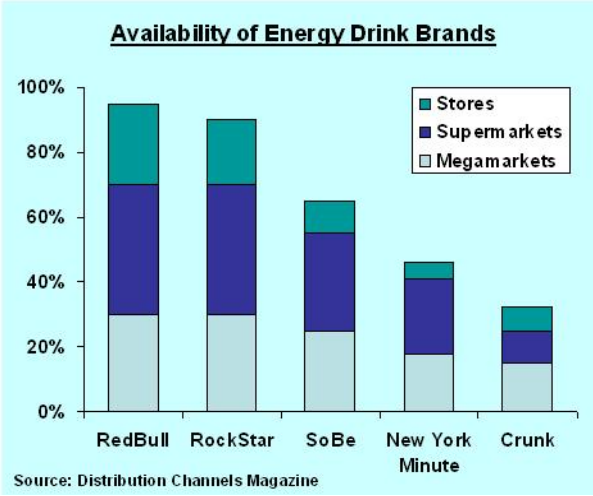
Criticism of New York Minute:





Which energy drink has the highest awareness level?

A recent study by the Beverage Network shows that New York Minute is not as good as its competitors in terms of consumer awareness. The study conducted with about 200 consumers residing in the tri-state area indicates that 85% of the participants has not heard about New York Minute (see chart on the left).



Which energy drink is more accessible?

A recent study by the Distribution Channels Magazine shows that New York Minute is not as good as its competitors in terms of availability. The study conducted with different types of retailers in the tri-State area indicates that less than half of the stores carries New York Minute (see chart on the left).

APPENDIX 4: Stimuli Used in Study 3

Low Expectations Condition:

The following is excerpted from the *New York Times*

A New Energy Drink from Battery: New York Minute

March 4, 2007

CEO of Battery Energy Drink Inc., Mikael Aro, said in a recent interview that they are introducing a new energy drink, New York Minute, to the New York market. “New York is one of the fastest growing markets in energy drink consumption in the US and we plan to introduce a new energy drink tailored to the specific needs of New Yorkers.”

Battery company officials commented that their goal with this new energy drink is to provide a solution to the fatigue created by high-stress, low-health-return metropolitan life style.

High Expectations Condition:

The following is excerpted from the *New York Times*

A New Energy Drink from Red Bull: New York Minute
March 4, 2007

CEO of Red Bull, Dietrich Mateschitz, said in a recent interview that they are introducing a new energy drink, New York Minute, to the New York market. “New York is one of the fastest growing markets in energy drink consumption in the US and we plan to introduce a new energy drink tailored to the specific needs of New Yorkers.”

Red Bull company officials commented that their goal with this new energy drink is to provide a solution to the fatigue created by high-stress, low-health-return metropolitan life style.

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