IMPULSE BUYING:
THE EFFECT OF DECISION TIME AND PRODUCT SCARCITY ON BUYING IMPULSE

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ABSTRACT

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Impulse buying is a critical and widespread phenomenon in consumer behavior and is considered a pervasive and distinctive aspect of consumers' lifestyles in the USA (Nguyen, *et al*., 2003). To increase their revenue, retailers make efforts to encourage consumers to make impulse purchases through point-of-purchase displays, price reduction promotions or coupons (Abratt & Goodey, 1990).

A scarcity appeal, one powerful selling tactic for retailers, has not been tested as an in-store stimuli to assess whether it could increase impulsive purchasing. This study suggests that providing an in-store promotion under a scarcity condition will increase consumer's impulsive buying and uncover mechanisms that explain this purchase behavior.

This study employs Brehm's (1966) psychological reactance as a theoretical foundation and investigated how a consumer chooses a product in a limited buying freedom condition. The purpose of this study was to examine the main effects of decision time and product scarcity on impulse responses. This study also examined the effect of two types of scarcity on perceived arousal and perceived competition, and further examined the interaction effects of two types of scarcity on the consumer's buying responses.

For data collection, an online experiment was conducted. Participants were recruited from Amazon.com's Mechanical Turk (MTurk). A 3 (decision time scarcity: 5 minutes *vs.* 1 hour *vs.* control (no decision time scarcity)) × 3 (product scarcity: 20 units left vs. 200 units left vs.

control (no product scarcity)) between subjects design was used. Participants were randomly assigned to 1 of 9 conditions.

The results revealed product scarcity affected buying impulse and impulse buying decisions. However, there was no direct effect of decision time scarcity on buying impulse and impulse buying decision. There was an effect of decision time scarcity on perceived arousal, and there was an effect of product scarcity on perceived competition. Perceived competition was related to perceived arousal. Perceived arousal and perceived competition were related to buying impulse. No significant interaction effects for the two types of scarcity conditions on buying impulse and perceived competition were found. The only significant interaction effect was for decision time and product scarcity on perceived arousal.

This study has extends the psychological reactance theory (Brehm, 1966) to understand impulse buying behavior in a consumer behavior context. Also, this study contributes to the scarcity effect literature by empirically examining the effect of scarcity tactics on impulse buying behavior. In addition, the current study contributes to impulse buying literature by identifying external factors that might encourage consumer's impulse buying. Marketing implications based on the findings of the study are provided.

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CHAPTER 1 INTRODUCTION

Impulse buying is a critical and widespread phenomenon in consumer behavior and is considered a pervasive and distinctive aspect of consumers' lifestyles in the USA (Nguyen *et al*., 2003). For example, reports indicate that 84 percent of residents over fifty in Washington State have made an impulse purchase in the past 12 months (AARP, 2010). A survey by Consumer Reports reported that 60% of women said that they bought something on impulse in the past year and 50% of them said they often made impulse purchases (Dolliver, 2009). Consumers make impulse purchases not only because of product need, but also for recreation or mood management. As disposable personal income increases, consumers might be more likely to make a purchase on a whim (Dittmar & Druary, 1999).

Retailers and manufacturers invest billions of dollars finding ways to encourage consumers to buy. Jeffrey and Hodge (2007) posited that even 1 percent of increased sales from impulse purchases have the potential to generate an additional $690 million in revenues for retailers. Increasing a consumer's consumption above what is on a 'shopping list' is a retailer's goal. To increase their revenue, retailers make efforts to encourage consumers' impulse purchasing through point-of-purchase displays, price reduction promotions, or coupons (Abratt & Goodey, 1990). However, the economic downturn has drove consumers to shop more frugally and this trend threatens retail sales (Business Trends, 2010).

To uncover what triggers people to buy on impulse, many academic studies have been conducted. Researchers investigated whether situational factors (e.g., in-store browsing, marketing stimuli, store layout, and current mood state) and individual factors (e.g., demographics, self-identity, shopping orientation, and impulsivity) instigate impulse purchasing (Abratt & Goodey, 1990; Beatty & Ferrell, 1998; Dittmar *et al*., 1995; Rook & Gardner, 1993;

Rook & Fisher, 1995; Zhou & Wong, 2003). In addition, impulse buying has been studied in several different shopping contexts such as off-line store, on-line store and television shopping programs (Iyer, 1989; Park & Lennon, 2004; LaRose, 2001). These statistics combined with researchers' strong interest in this topic indicate that impulse buying is an important aspect of consumer behavior to be studied, for academic researchers as well as marketers.

Problem Statement and Significance of the Study

The scarcity principle, proposing that as items and opportunities become scarce, they are perceived as more valuable, has been studied for several decades (Brock, 1968; Cialdini, 1985; Lynn, 1991). Retailers and advertisers employ the scarcity principle as one of their promotion techniques to stimulate consumer spending. For example, Kmart, known for its "blue light special" offered certain products with a price discount for a certain limited time while the blue light was on. Its promotion emphasized "get it before it's gone" and stimulated consumers to purchase (Albright, 2007). Shopping hosts on TV home shopping channel surge consumers to order by emphasizing a dwindling supply of the product and limited time offer.

Recent efforts to examine the effects of scarcity buying conditions on consumer behavior have focused on purchase intention (Aggarwal *et al*., 2011; Bae & Lee, 2005). Most studies in an advertising or retail context have examined restricted buying opportunity under a planned buying setup (Inman *et al*., 1997; Suri *et al*., 2007). However, there is limited research examining the effect of time scarcity and product scarcity on impulse buying behavior (Li, 1995). This study extends the literature by testing whether the scarcity principle motivates impulse buying in a retail shopping context.

It has been suggested that in-store stimuli such as point-of-purchase displays or price-off promotions trigger consumer's impulse buying in a retail shopping context (Abratt & Goodey;

1990; Dholakia, 2000; Piron, 1991). However, a scarcity appeal, one powerful selling tactic for retailers, has not been tested as an in-store stimuli to assess whether it could increase impulsive purchasing. This study suggests that providing an in-store promotion under a scarcity condition will increase consumer's impulsive buying and uncover mechanisms that explain this purchasing behavior. Further, scarcity conditions could increase consumer's arousal level, perceived competition with other shoppers, and purchase impulsivity at a state level.

Previous studies on impulse buying suggested that there is a positive relationship between time availability and impulse buying. Beatty and Ferrell (1998) suggest that as consumers have more time availability, they have more time to browse. They further posit that increased browsing time increases a felt urge to buy impulsively. Similarly, it has been claimed that time available to perform a task has a positive relationship with unplanned purchasing (Bellenger *et al*., 1978; Iyer, 1989; Jarboe & McDaniel, 1987; Park *et al*., 1989). Park and Lennon (2006) also reported similar results of a positive relationship between browsing time duration and impulse buying tendency when shopping in a television setting.

An underlying notion of a positive relationship between time availability and impulsive spending is that increased time availability increases the opportunity to be exposed to marketing stimuli. Using this logic, Iyer (1989) argues that people who shop under time pressure are motivated to purchase their planned items in order to complete the task, so they do not consider other products. Based on the literature, it is plausible that staying longer in the shopping space increases the chance of impulse buying. However, it is hard to determine whether increased time availability influences "only" impulse buying. If we have plenty of time available and visit several stores at the mall, we might also make a reminder purchase by recalling a product need in addition to purchasing planned items. Therefore, it would be more reasonable to assume that

increased time spent on a shopping trip increases total purchase amount, including impulse purchases. In addition, when we think of the definition of impulse buying as buying that occurs as a sudden, often powerful urge to buy (Rook, 1987), there is no strong evidence that having abundant time to shop directly encourages a felt urge to buy. Because impulse buying occurs after consumers are exposed to the product (Piron, 1991) and is manifested by a sudden urge on the spur of moment (Rook, 1987), the influence of time-related factors on impulse buying should be investigated at the moment of decision-making, rather than total shopping duration. In this study, the effect of scarcity in time for decision-making on impulse buying will be investigated.

In a limited-time promotion, consumers do not compete with other consumers because products are available if purchase is made within the deadline. On the other hand, in limited-quantity promotion, unless consumers react rapidly, they might miss the chance to buy the product due to its limited supply. While results indicate that a limited-quantity message is more effective in influencing consumer's purchase intention than a limited-time message (Aggarwal *et al*., 2011), there is limited study investigating the effect of scarcity in product quantity on impulse buying (Li, 1995). Therefore, this study investigates the effect of product scarcity on impulsive purchasing.

The increase of work hours in economically-developed countries evokes a growing perception of time poverty such that people think they have too much to do and not enough time. Nowadays, 24/7 stores or online shopping malls allow people to shop any time they want. These increased convenient services support consumer's freedom to choose products at the right place at the right time. The opportunity to acquire products anytime satisfies consumer's freedom, but also increases consumer's "intolerance of unavailability" (Mitchell, 1998). This indicates that people are accustomed to buying freedom and dislike it when their buying freedom is restricted.

This intolerance of unavailability describes psychological reactance, and has been demonstrated as a robust theory in understanding how people respond to eliminated or restricted freedom (Brehm, 1966). Reactance theory suggests that when an individual's behavioral freedom is restricted or threatened, such as product unavailability, one perceives this threatened behavior to be more attractive and tries to regain freedom (Brehm, 1966). This study employs psychological reactance as a theoretical foundation and will investigate how a consumer chooses a product in a limited buying freedom condition.

This study contributes to theoretical and practical implications in the following ways: theoretically, this study extends the application of psychological reactance theory (Brehm, 1966) to impulse buying. This will enable us to understand whether the scarcity principle has an impact on consumer's state impulsivity.

Most impulse buying studies investigating time-related antecedents have focused on the entire amount of time spent shopping (e.g., Iyer (1989) - entire time spent on grocery shopping; Beatty & Ferrell (1998)- entire time spent on shopping trip at the mall), and have suggested a positive relationship between time spent shopping and impulse buying. However, there are limited studies investigating the effect of available time on impulse buying from a decision-making perspective (Li, 1995). This study proposes a counter argument to previous work by suggesting that time limitation, rather than time abundance in decision-making could influence impulse buying. Therefore, this study will shed light on the conflicting findings.

Many experimental studies that manipulated scarcity conditions focused on only one type of scarcity condition, such as time scarcity (Spears, 2001; Suri *et al*., 2007) or product scarcity (Gierl & Huettl, 2010; Ku *et al*., 2012; Wu, 2012). In addition, while the effectiveness on buying responses between two-scarcity conditions has been investigated, little research exists examining

the interaction effects of these two scarcity conditions on consumer's buying intentions (Aggarwal *et al*., 2011). This study will contribute by testing whether encountering two scarcity conditions simultaneously will accelerate consumer's purchasing behavior.

Practically, this study may be beneficial to both consumers and retailers. When people realize that items are scarce or unavailable, they tend to want these items drastically more than before (Cialdini, 1985). This study suggests that restrictions in decision time and product quantity limitation should increase consumer's impulsivity, as a result of reactance to restricted buying freedom (Brehm, 1966). Marketing practitioners may increase their understanding of whether limited buying opportunity under time scarcity and product scarcity is an effective strategy to increase consumer's purchase impulsivity. Such knowledge may provide insights for retailers and marketers to establish effective marketing stimuli that may encourage consumer's impulsive spending. Also such knowledge enables them to sell merchandise by using profitable scarcity tactics and efficiently manage an adequate level of inventory. From this study, consumers may recognize the influence of buying freedom such that people tend to make more purchases in a restricted buying condition. Those who may want to reduce impulsive purchasing will be able to recognize marketing stimuli that might create purchase impulsivity and therefore resist the temptation.

Purpose of the Study

The objective of this study is to investigate the effect of scarcity buying conditions (time and quantity scarcity) on consumer's buying responses in a retail setting. The main purpose of this study is to examine whether or not the scarcity principle accelerates the likelihood of impulse buying. By employing psychological reactance as the theoretical foundation, this study explores whether or not consumers with restricted buying freedom are more likely to make

purchases or feel the urge to buy impulsively. Specifically, this study examines the effect of an in-store price discount promotion with decision time and product scarcity conditions on purchase impulsivity, arousal, and perceived competition. In addition, this study also examines whether there is a relationship between purchase impulsivity, arousal, and perceived competition. Finally, this study examines any interaction effects of decision time and product scarcity on consumer responses.

Organization of the Dissertation

The dissertation is composed of six chapters. Chapter 1 presents an introduction to impulse buying, purpose of the study, and significance of the study. Chapter 2 provides a definition of impulse buying, theoretical foundation, decision processes of impulse buying, discussion of constructs, and hypotheses development. Following this, Chapter 3 covers the research methods, including research design, procedure, and instrumentation. Chapter 4 provides findings from hypotheses testing. Chapter 5 covers a detailed interpretation of findings in main effects and interaction effects. Chapter 6 presents implications of the results, limitations, and suggested future research.

CHAPTER 2 THEORETICAL FRAMEWORK

Definition of Impulse Buying

Considerable research about impulse buying behavior has been conducted over the past 50 years (Dholakia, 2000; Dittmar *et al*., 1995; Kollat & Willet, 1969; Zhou & Wong, 2003). Early studies about impulse buying focused on its definition (e.g. Bellenger *et al*., 1978; Iyer, 1989; Kollat & Willet, 1967; Stern, 1962), and findings indicate a lack of consensus in defining impulse buying (Kollat & Willet, 1969). While several researchers considered impulse buying to be the same as unplanned buying (e.g. Abratt & Goodey; 1990; Bellenger *et al*., 1978; Iyer, 1989; Kollat& Willet, 1967; Stern, 1962), some argued that impulse buying is just one form of an unplanned purchase.

Dholakia (2000) suggested that impulse buying is associated with an extremely short time span. Rook (1987) asserted that impulse buying cannot occur without an immediate urge. He defined impulse buying as behavior that arises from a sudden, spontaneous urge without thoughtful consideration (Rook, 1987). Beatty and Ferrell (1998) extended Rook's (1987) definition by adding "no previous buying intention". This study adopts Beatty and Ferrell's (1998) definition because the definition is narrowly defined and has been adopted by many impulse buying studies (Luo, 2005; Parboteeah *et al*., 2009; Vohs & Faber, 2007).

> "*Impulse buying is a sudden and immediate purchase with no pre-shopping intentions either to buy the specific product category or to fulfill a specific buying task. The behavior occurs after experiencing an urge to buy and it tends to be spontaneous and without a lot of reflection (i.e., it is "impulsive"). It does not include the purchase of a simply reminder item, which is an item that is simply out-of-stock at home*" *(Beatty & Ferrell, 1998; p. 191).*

This study will not consider a reminder purchase as impulse buying, which is defined as consumers being reminded about an actual product need during the shopping trip and then purchasing it. In this study, we regard only impulse purchases as fulfilling the above definition as true impulse buying. In sum, the present study focuses only on true impulse buying, a purchase having occurred due to increased impulsivity that was encouraged by an unexpected shopping environment or stimuli.

There is sometimes confusion between impulse buying and compulsive buying. There are three main points that differentiate impulse buying from compulsive buying. The first point of differentiation is degree of self-regulation. Impulse buying occurs when consumers experience a momentary loss of impulse control. However, compulsive buying occurs from a chronic loss of impulse control (O'Guinn & Faber, 1989). Compulsive buying is repetitive, and has obsessive characteristics. The second standard is motivation. Impulse buyers usually make a purchase because they experience a sudden urge to possess a particular item. However, compulsive buyers make a purchase not only to possess the product, but use purchasing as a way of alleviating their negative mood. After the purchase, both impulsive buyers and compulsive buyers experience immediate gratification from possession of the product. However, compulsive buyers are not really interested in the product itself after the purchase is made. A desire to increase self-esteem also motivates compulsive buying. By possessing a desired product, a consumer temporarily feels increased self-esteem. Some people who want social interaction also make compulsive purchases (O'Guinn & Faber, 1989). The third standard is consequence of purchase. After the purchase, impulse buyers usually experience uplift because they now possess the product. Because an impulse purchase is not repetitive, that purchase does not lead to a severe problem. For example, excessive credit card debt is very rare in impulse buying (O'Guinn & Faber, 1989).

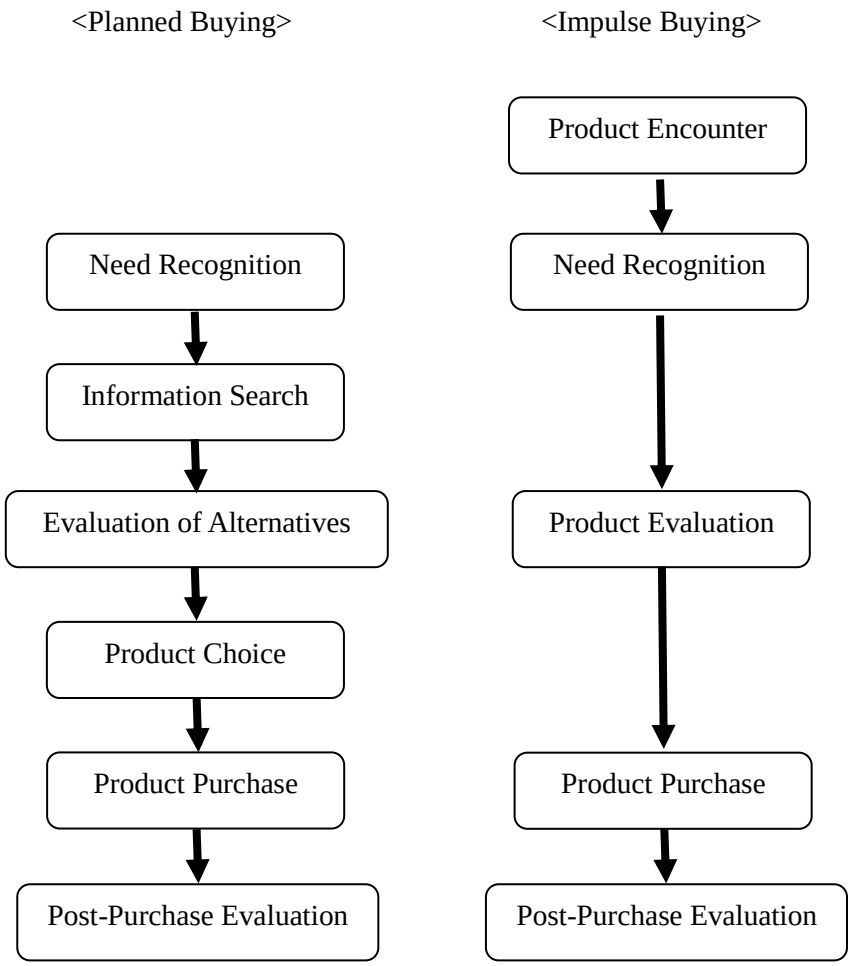
On the other hand, compulsive buyers have severe problems with their repetitive purchasing. They sometimes have problems with credit card debt. In addition, they do not experience enjoyment from the purchase after time passes. They usually experience guilt and anxiety because they think they spend money uselessly. Compulsive buyers who experience guilt buy again to alleviate these negative moods. Therefore, their behavior is described as a vicious cycle (O'Guinn & Faber, 1989). Consequently, impulse buyers could be compulsive buyers at some point if they purchase on impulse repeatedly, but they are not necessarily compulsive buyers without the repeated purchase behavior. In this study, we only focus on only impulse buying, because we examine whether or not instant felt urge to buy occurs in some conditions.

Decision-making Processes of Impulse Buying

Decision-making processes in general planned buying usually go through 1) need recognition, problem awareness, 2) information search, 3) evaluation of alternatives, 4) purchase, and 5) post-purchase evaluation (Engel & Blackwell, 1982). However, impulse buying goes through fewer steps in the decision-making process compared to general planned buying (Figure 1). First, there is no product information search in impulse buying. Because impulse buying starts with need recognition at the point of encountering a certain product (Li, 1995), there is no prior search for product. Second, alternative evaluation does not occur with impulse buying. Because impulse buying occurs as a result of a powerful product attraction, it is assumed that people may focus on a single product rather than consider multiple products. If people recognize a product need after being exposed to the product and start comparing different brands, accompanied with cognitive information processing, it is no longer an impulse purchase (Piron, 1991); once brand comparison occurs, it represents one form of general unplanned purchase with deliberation (Bellenger *et al*., 1978; Kollat & Willet, 1967). In summary, impulse buying requires

less cognitive effort and time than general planned purchasing because it goes through a simplified buying process (Hausman, 2000). Also, some researchers suggest that impulse buying is associated with an extremely short time span (Dholakia, 2000; Rook, 1987) and impulse buyers do not spend much time on in-store information processing and product quality (Cobb & Hoyer, 1986; Jones *et al*., 2003). Therefore, impulse buying skips selection decision (i.e., which brand to choose) and directly goes to the decision of whether or not to choose the product (Dhar & Nowlis, p. 369, 1999).

Figure 1 Processes of Planned vs. Impulse Buying



In-store Promotion as an External Trigger of Impulse Buying

Prior studies found several factors that trigger impulse buying. Impulse buying triggers are divided into two types, external factors and internal factors (Wansink, 1994). External factors refer to cues or stimuli controlled by marketers and internal factors refer to individual moods or emotional states (Youn & Faber, 2000).

As an external factor, shopping environment was found to be an important factor that may trigger impulse buying. Environmental factors include not only store atmospheric cues but also marketing mix cues or social cues (Youn & Faber, 2000), because these factors contribute to setting store's shopping conditions. Store atmosphere (e.g., music, smell, layout, colors), marketing mix cues (e.g., point-of-purchase, product displays, in-store promotions), and social cues (e.g., salesperson interaction) are associated with product sales (Donovan, & Rositter, 1982; Grewal & Sharma, 1991; Han *et al*., 1991; Mehrabian & Russell, 1974). Among these environmental cues, in-store stimuli were significant factors that may encourage impulse buying (Dholakia, 2000; Iyer, 1989).

For example, Abratt and Goodey (1990) conducted face-to-face interviews in their qualitative research. They counted the number of various kinds of in-store stimuli mentioned in the respondent's recall of an impulse purchase. They found that in-store stimuli such as shelf signs, price, and special display motivated shoppers to remember a product need, leading to a reminder impulse purchase.

Zhou and Wong (2003) conducted research investigating the influence of in-store stimuli on impulse buying in the supermarket. 255 shoppers participated in mall intercept surveys. Researchers asked the respondents to reflect on the influence of in-store point-of-purchase stimuli on their supermarket shopping. The results revealed that promotional effects such as

offering special discounts and cheaper prices of in-store point of purchase (POP) positively affected impulse purchasing.

Dawson and Kim (2009) conducted a content analysis of apparel websites from focus group interviews. They identified 20 external impulse trigger cues in an online apparel store, and classified these cues into four categories: sales, promotions, ideas, and suggestions. For example, the sales category included clearance sales or markdowns, promotions included coupon or gift with purchase, ideas included featured items or top picks, and suggestions included suggested coordination items or customer reviews. Dawson and Kim (2009) concluded that while all the external cues are influential, all were equally effective in motivating impulse buying.

Liao *et al*., (2009) examined the effects of sales promotion on reminder impulse buying behavior. In their experimental research, they recruited 224 participants who had bought a particular cosmetic brand. After 3 months, researchers assigned the same participants a reminder impulse buying scenario containing the same cosmetic brand offering a promotion. The results revealed that sales promotion strategy has a positive impact on reminder impulse buying. Also, they found that an instant-reward promotion such as immediate price discount has a greater influence on reminder impulse buying than delayed-reward promotion such as free promotional gift.

Previous studies investigating the effect of in-store promotion on impulse buying have found that a price discount may trigger impulse buying (Dholakia, 2000; Piron, 1991). Making a purchase stimulated by a price reduction is associated with the monetary value of saving money, which is a relatively rational and economic decision. However, when we think that impulse buying is characterized as emotional and hedonic driven, a price reduction only should not be strong enough to encourage consumer's pure impulse buying. This is why some researchers

suggested that price discount triggers reminder impulse buying, which is more rationally motivated and utilitarian than pure impulse buying (Abratt & Goodey, 1990, Liao *et al*., 2009; Stern, 1962). Therefore, this study suggests that there may be additional stimuli that could increase consumer's sudden urge to buy the item in addition to price discount stimuli. This study proposes that scarcity buying conditions would accelerate consumer's pure impulsive purchasing.

Buying Impulse at State Level

Basically, impulse (impulsivity) is described as a tendency to act without thoughtful deliberation and to fail to reflect on future outcomes before acting (Fahy & Eisler, 1993). It has been found that people with high impulse tend to have difficulty in self-control. For instance, impulsive people are associated with pathological gambling (Rodriguez-Jimenez *et al*., 2006), problematic Internet usage (Lee *et al*., 2012), eating disorders (Scherr *et al*., 2010), and risk taking behavior (Cheng & Lee, 2012). In consumer buying behavior, consumer's impulse is significantly associated with impulse buying (Youn & Faber, 2000). Consumer impulse is characterized by spontaneous, reckless, and careless consumption behaviors (Youn & Faber, 2000).

In consumer behavior literature, buying impulse is divided into two aspects: buying impulse as personal trait and buying impulse as state level. Buying impulse as personal trait refers to a dispositional tendency to act impulsively. Buying impulse as a state level is characterized as a temporary change in an individual's level of impulse due to an outside factor. A significant association has been found between trait buying impulse and impulse buying (Beatty & Ferrell, 1998; Rook & Fisher, 1995; Sharma *et al*, 2010; Youn & Faber, 2000). However, impulsive people may not always be impulsive, and non-impulsive people may be impulsive at certain times. Buying impulse should be investigated at the state level as well as trait level (Wingrove &

Bond, 1997). State impulse is an important antecedent factor inducing impulsive purchasing (Beatty & Ferrell, 1998). Beatty and Ferrell (1998) describe state buying impulse as "a state of desire that is experienced upon encountering an object in the environment" (p. 172). Dholakia (2000) also proposed "consumption impulse (CI)" as state level of buying impulse and described CI as "irresistible urge to consume (p. 961)". He claimed that marketing stimuli, impulsive trait, and situational factors can affect CI. Hoch and Loewenstein (1991) suggested that consumer's level of buying impulse can be temporarily increased when a product or product deal is perceived as physically or temporally close. Therefore, consumer buying impulse as a state level may be temporarily reinforced or suppressed by external shopping environments such as marketing stimuli. This study defines buying impulse as consumer's sudden urge to buy a certain product or product deal (Beatty & Ferrell, 1998).

Theoretical Foundation: Psychological Reactance

Psychological reactance theory was first introduced by Jack Brehm (Brehm, 1966; Brehm *et al*., 1972; Hammock & Brehm, 1966). The theory explains how one reacts when freedom is restricted. According to the theory, when an individual's behavioral freedom is restricted or threatened with reduction, motivational arousal occurs. This arousal makes an individual's threatened behavior more attractive and leads one to resist any further loss of freedom and motivates one to regain the freedom. Psychological reactance is described as the motivational state in response to the restriction of one's behavior. Brehm (1966) suggests that the level of reactance arousal varies depending on the importance of that freedom to the individual.

Several recent studies examined reactance theory Rummel *et al*. (2000) examined whether children exhibited reactance when parents disapprove of having a product and examined whether its reactance is moderated by individual differences. They revealed that adolescents exhibited

higher preferences toward the product that parents disapproved of, while younger children exhibited lower preferences for these products.

Bessarabova *et al*. (2013) suggested that failure of many campaigns is attributed to freedom-threatening messages, which create reactance. Through an experiment, they found that recycling campaign containing "must" statement (high level of freedom threat) leads to the behavioral intention change in the opposite direction, which indicates boomerang effect. They suggested that high level of freedom-threatening message might reduce the persuasion effect.

Jones *et al.* (2014) examined the effect of requests for positive evaluation on customer's satisfaction. They found that consumers who were asked to provide a positive evaluation rated a lower level of customer satisfaction, while those who were not asked rated a higher level of customer satisfaction.

Reactance theory, having its roots in social psychology and initially applied by psychology researchers, is currently broadening its application to various research areas. According to Clee and Wicklund (1980), reactance theory has wide applicability to all consumer behavior contexts where consumer's freedom is reduced or threatened such as high-pressure promotional influence, product unavailability, and increased product price. According to Reactance theory, product unavailability such as product scarcity in quantity, product discontinuation, a long waiting line, and physical distance might restrict consumer's freedom of choice and produce reactance (Clee & Wicklund, 1980). Reactance theory posits that when an individual's freedom to make a decision among the alternatives is threatened by unavailability of a certain alternative, he experiences increased attraction to the unavailable product, regardless of whether it was preferred or not (Brehm, 1966). Some research applying psychological reactance in consumer behavior has investigated the scarcity principle. For example, Mazis *et al.* (1973) found that

residents in Miami whose phosphate detergent was prohibited evaluated the detergent more positively than those in Tampa where phosphate detergent was not restricted. In a similar vein, Lessne (1987) found that consumers showed higher purchase intention for the promotional offer "One day only" rather than "Three day only" offer. Recent studies, Aggarwal *et al*. (2011) examined the effect of two types of scarcity on consumer's purchase intention. They found that a limited-quantity restriction is more effective than time-limited restriction. They also found that scarcity messages can create a sense of competition among the buyers. Gupta (2013) examined the effects of perceived scarcity on consumer buying behavior in fast fashion retail settings and found that perceived scarcity creates consumer's sense of urgency, and further influences in-store hoarding behaviors.

This dissertation employs psychological reactance theory as a theoretical foundation. The current study expects that reactance in a restricted buying situation might be associated with consumer's buying impulse, which in turn influences purchase intention. We expect that reaction to a threatened buying opportunity will induce consumer's felt urge to acquire a product.

Scarcity Principle

The condition under which items and opportunities are less available is termed "scarcity". As items and opportunities become scarce, they are perceived as more valuable (Brock, 1968; Cialdini, 1985; Lynn, 1991). As items and opportunities become scarce, people lose freedom to make a free choice. Because people dislike their freedom to be threatened, their reaction to regain freedom leads them to want scarce items drastically more than before (Cialdini, 1985).

According to Cialdini (1985), when a person encounters an object's scarcity, his ability to think is hampered and brain-clouding is aroused, a desire for the product is increased, and eventually he reacts automatically to obtain the object without thinking. Individual's automatic

response to scarcity is described as "click-whirr" (i.e., click and the appropriate tape is activated; whirr and out rolls the standard sequence of behaviors), "shortcut responding", or "knee-jerk response" (Cialdini, 1993).

When people choose a product, they tend to go through product evaluation processes by capitalizing on their extant product information. Usually, this process requires a certain period of time for the decision about whether to choose or not. However, sometimes consumers reduce these product evaluation processes and directly make a purchase decision, termed judgmental heuristics (Cialdini, 1985, p. 6). Cialdini (1993) suggests that if consumers encounter products under a scarcity condition, they perceive "what is rare is good" and tend to make a rapid purchase decision by employing scarcity as a heuristic cue. Cialdini (1993) describes a heuristic decision under the scarcity condition as a less rational behavior.

Cialdini (1993) suggested that scarcity generation is the most powerful way of intentionally altering one's behavior. The scarcity principle has long been capitalized on by marketing practitioners. "Scarcity appeal" is a widely used advertising technique in marketing communication. Advertisers offer promotional messages emphasizing product scarcity information to consumers via TV commercial, magazines, or newspapers. In addition, a scarcity strategy is broadly adopted by fast fashion retail, and Home Shopping Club (HSC). Fast fashion retailers, such as ZARA, H&M, and Forever21 provide limited product quantities while producing products quickly in response to fashion trends. HSC marketers employ the scarcity strategy by presenting a featured product for a limited time with limited quantity.

In the academic area, researchers identified a significant effect of scarcity message on consumer's responses. Consumers exposed to time or product scarcity messages exhibited higher purchase intention (Aggarwal *et al*., 2011; Bae & Lee, 2005; Inman *et al*., 1997; Ku *et al*., 2012;

Wu *et al*., 2012), higher desirability of the product (Gierl *et al*., 2008), higher perceived quality (Suri & Monroe, 2003; Suri *et al*., 2007), higher preference (Parker & Lehmann, 2011;Verhallen, 1982) and perceived higher monetary sacrifice (Suri & Monroe, 2003; Suri *et al*., 2007). In a retail setting, some studies found a positive effect of product scarcity on sales volume (Gierl *et al*., 2008), an effect of shelf-based scarcity on consumer preference (Parker & Lehmann, 2011), and perceived scarcity on in-store hoarding (Byun & Sternquist, 2011; Byun & Sternquist, 2012).

Basically, product scarcity is divided into two types: limited time scarcity (LTS) message and limited quantity scarcity (LQS) message (Cialdini, 2008). A LTS message is when the offer is only available for a certain period time. A LQS message is when the offer is only available due to limited product quantity.

However, LTS and LQS can be operationalized in various ways: LTS has been operationalized as product available until a defined period (e.g., offer available until this Sunday) (Aggarwal & Vaidyanathan, 2003; Inman *et al*., 1997) or product available while stocks last (Gierl & Huettl, 2010), and LQS has been operationalized as limited quantity (e.g. First 100 customers only) (Aggarwal *et al*., 2011), sales restriction on product quantity (e.g. limit 2 per customer) (Inman *et al*., 1997), or limited edition (Eisend, 2008; Wu *et al*., 2012). It is predicted that consumer's responses may vary depending on different types of time and product scarcity messages (Gierl *et al*., 2008). Therefore, it is important to conceptualize and operationalize time and product scarcity in a precise manner.

Hypotheses Development

Scarcity Conditions (Decision Time and Product Scarcity) and Buying Impulse

Time is one factor that influences impulse buying behavior (Stern, 1962). Previous impulse buying studies examining the effect of time have conceptualized time constraint as the limited amount of time available on one's whole shopping trip (Bellenger *et al*., 1978; Iyer, 1989; Jarboe & McDaniel, 1987; Park *et al*., 1989). However, impulse buying is a behavior that occurs in a short span after being exposed to the product or product stimuli (Piron, 1991), so it needs to be investigated at the point of decision-making. Therefore, we define the time constraint as the limited amount of time available at the point of decision-making.

A short time allowance to make a decision restricts consumer's freedom to choose an object. Reduction in the freedom of decision-making (i.e., product choice) should produce reactance and consumers will be motivated to make a product purchase to regain their decision-making freedom. Also, emphasizing expiration of a buying opportunity in the near future should create a sense of urgency and enhance product desirability (Bae & Lee, 2005).

Because people tend to be excited about an immediately available reward and lose excitement for a reward with a large temporal distance (Chung & Herrnstein, 1967), making choices for present usage are likely to be vice choices (e.g., purchasing an unhealthy food) while making choices for future usage are likely to be virtuous choices (e.g., purchasing a healthy food) (Read *et al*., 1999). Laran (2010) posits a similar argument that consumers are likely to make more rational choices for the future while they are likely to make less rational choices for the present. Exerting self-control depends on the temporal distance of decision-making. In Hoch and Loewenstein's (1991) reference–point model of desire, they assert that a sudden increase in

desire for product possession is created by a shift in the consumer's reference point. They suggested that when a stimulus such as promotional offer is perceived as temporally close, a shift in reference point to product desire is increased; hence, felt urge to buy is created. Thus, a tight time limit to make a decision would be a factor in promoting the immediate availability of a reward, in the form of product possession. In other words, it is predicted that temporal proximity in decision time will play a role in increasing consumer's felt urge to buy the product. Consumers stimulated by decision time constraint should make a simple and rapid decision by employing time constraint as a heuristic cue. Decision time constraint should lead to heuristic information processes in decision-making and will result in higher likelihood to purchase a product.

In this study, we assume that the effect of decision time constraint on buying impulse is relevant only when the product itself or a product deal is attractive. Reactance theory posits that reactance occurs when a threatened freedom is important for the individual to regain. Research also found that consumers exhibit purchase intention only when a product under restricted marketing offer is perceived as attractive. Consumers will simply ignore the product, unless the product is attractive to them. It is suggested that a scarcity technique is effective with large price discount rates in causing product attractiveness (Gierl *et al*., 2008; Inman *et al*., 1997; Verhallen, 1982). Therefore, this study assumes that the object that a consumer buying impulse was attractive enough to be considered.

In summary, we believe that decision time constraint, inducing a sense of urgency and increased desirability, increases one's urge to buy impulsively. Finally, this will result in impulse buying. Therefore, it is predicted that people exposed to an attractive product deal with limited time availability for decision-making will manifest greater buying impulse than those with

abundant time availability. Limited time will lead to impulse purchasing by heuristic information processing. Therefore, the following hypothesis is proposed:

H1 (a)-(b): Consumers exposed to the high level of decision time scarcity condition will (a) exhibit greater buying impulse and (b) make more impulse buying decisions than those exposed to the no decision time scarcity condition and the low level of decision time scarcity condition.

Product scarcity is defined as a limited quantity of product due to dwindling supply. Scarce objects intensify the desirability of a commodity and induce favorable product evaluation (Brock, 1968; Cialdini, 1985; Lynn, 1992). Also, product scarcity increases immediate perceived value (Wu *et al*., 2012) and results in less considered and automatic responses by consumers (Cialdini, 1985).

Scarcity messages about quantity have a positive impact on perceived consumer competition and purchase intention for the product (Aggarwal *et al*., 2011), and perceived product scarcity influences consumer's in-store hoarding in the fast fashion retail environment (Byun & Sternquist, 2008). In addition, perceived product scarcity induces a sense of urgency to possess the product (Wu *et al*., 2012).

Limited product quantity restricts a consumer's opportunity to own the product, which in turn, threatens one's freedom to possess a desired product. Threatened freedom to choose will lead to increased desirability of the product. Also, as a reactance to threatened freedom, people will try to regain their freedom by expediting the purchase. Therefore, limited product quantity will result in the creation of a sense of urgency to possess the product, increasing buying impulse,

thus people will make a prompt decision by using product scarcity as a heuristic cue.

When consumers encounter a sales promotion that specifies a limited product quantity, they should demonstrate a more sudden urge to possess the product than those exposed to abundant product quantity. Therefore, it is predicted that consumers exposed to a limited product quantity in their promotion offer will be likely to experience greater buying impulse than those than those exposed to abundant product quantity.

H2 (a)-(b): Consumers exposed to the high level of product scarcity condition will (a) exhibit greater buying impulse and (b) make more impulse buying decisions than those exposed to the no product scarcity condition and the low level of product scarcity condition.

Perceived Arousal

According to the environmental psychology approach developed by Mehrabian and Russell (1974), environmental conditions such as physical or social environments elicit human emotional responses and these emotional responses affect a variety of behaviors. They suggested three emotional dimensions are characterized by responses to environmental conditions: pleasure, arousal, and dominance. Arousal is defined as a feeling state varying from feelings of excitement, stimulation, alertness or activeness to feelings of being tired, sleepy or bored (Adelaar *et al*., 2003, p. 249). Arousal was found to be an important mediating variable that affects behavior when people encounter certain environmental stimuli.

In a context of retail store environment, in-store sales promotion with a limited time offer and limited product quantity represent physical or social stimuli that can directly influence a consumer's emotional state, and in turn, affect consumer's buying behavior (Donovan & Rossiter,

1982). When an individual's behavioral freedom is restricted or is threatened with reduction, motivational arousal occurs. This arousal makes an individual's threatened behavior more attractive and leads one to resist any further loss of freedom and creates a motivation to regain the freedom. Time limitation in decision-making and product limitation increase consumer's sense of urgency, excitement, and tension. Therefore, it is predicted that consumers who are exposed to a sales promotion with limited time offer will be more stimulated and feel more emotionally activated than those simply exposed to sales promotion. In addition, consumers who are exposed to a promotion that emphasizes limited product quantity will exhibit more emotional arousal than those simply exposed to sales promotion.

H3: Consumers exposed to the high level of decision time scarcity condition will exhibit greater perceived arousal than those exposed to the low level of decision time scarcity condition and no decision time scarcity condition.

H4: Consumers exposed to the high level of product scarcity condition will exhibit greater perceived arousal than those exposed to the low level of product scarcity and no product scarcity condition.

According to Sanbonmatsu and Kardes (1988), consumers in a high level of arousal are more likely to be persuaded by peripheral cues such as product attractiveness and have difficulty in making an accurate evaluation of advertising. Fedorikhin and Patrick (2010) asserted that a high level of arousal hinders deliberate affect regulation and results in a focus on immediate pleasure. It has been suggested that people in elevated arousal are less likely to resist the temptation. Therefore, it is predicted that people in elevated arousal state are more likely to

experience buying impulse and make greater impulse purchases.

H5 (a): There is a positive relationship between perceived arousal and buying impulse.

H5 (b): Consumers in high level of perceived arousal will make more impulse buying decisions than those in low level of perceived arousal.

Perceived Competition

A competition occurs when items or assets are perceived to be scarce. Limited resources are perceived to be more valuable and desirable, thus scarcity situations can create a sense of competition (Cialdini, 1993; Lynn, 1989).According to Cialdini (2008), people want an item more when it is scarce and they want it most when there is a competition for the item. Aggarwal *et al*. (2011) suggested that restriction on a promotional offer is perceived as a limited resource and it instigates consumer's competition. Aggarwal *et al*. (2011) defined consumer competition as "the act of a consumer's striving against one or more consumers for the purpose of achieving a desirable economic or psychological reward" (Aggarwal *et al*., 2011, p. 20).Price discount promotion stimulates a consumer to obtain the bargain. Obtaining the bargain provides consumers with "smart shopper feelings" as well as economic value (Schindler, 1998). Therefore, if consumers notice that a bargain is under time and supply limitation, it will accelerate the sense of competition among the buyers.

Aggarwal *et al*. (2011) conducted experimental research examining the relative effect of scarcity messages on consumer's purchase intention and the mediating role of consumer competition. A wrist watch advertisement was presented with either limited time scarcity (for six days only) or limited quantity scarcity (first 100 customers only) or non-scarcity conditions to the participants. They found that consumer competition played a mediating role between scarcity

messages and purchase intention. This finding indicates that when items are scarce, they are perceived as more valuable and increase perceived competition among the shoppers. Therefore, it is predicted that consumers exposed to in-store promotion under high level of scarcity conditions will experience more perceived competition than those under low level of scarcity conditions. In time scarcity condition, consumers could acquire the item without competition only if they meet the deadline. That is, limited time offer does not create competition against other shoppers (Aggarwal *et al*., 2011). Therefore, this study investigates only the effect of limited product quantity condition on perceived competition.

H6: Consumers exposed to the high level of product scarcity condition will exhibit greater perceived competition than those exposed to the low level of product scarcity condition and no product scarcity condition.

Competitive buying situations stimulate consumer's fear of unavailability and accelerate purchase intention (Aggarwal *et al*., 2011; Byun & Sternquist, 2008;Lynn, 1992).The fast fashion industry is known as creating a competitive buying condition among shoppers due to its low supply and quick inventory turnover (Byun & Sternquist, 2008; Hayes & Jones, 2006). Studies in the fast fashion industry revealed that buyers who perceive competing among shoppers tend to experience a sudden or irresistible urge to possess the items and grab the items and its behavior reflects impulsiveness (Byun & Sternquist, 2008). Likewise, it is predicted that if the buying condition is perceived as competitive in a general retail environment, consumers will be likely to obtain the product first, and think later. Therefore, it is predicted that perceived competition is positively related to buying impulse and impulse buying.

H7 (a): There is a positive relationship between perceived competition and buying impulse.

H7 (b): Consumers in high level of perceived competition will make more impulse buying decisions than those in low level of perceived competition.

When there is a competition among the consumers, it will stimulate consumers' state of arousal. Competition between buyers might create a perception that the products will be unavailable when they want, so it will create fear of product unavailability and sense of urgency. Therefore, H8 is hypothesized as follows:

H8: There is a positive relationship between perceived competition and perceived arousal.

As suggested earlier, a consumer's level of buying impulse might be temporarily increased by the external shopping environment (Hoch & Loewenstein, 1991). Experiencing buying impulse results in two tendencies: enactment or resistance of impulsive buying behavior (Dholakia, 2000). It has been suggested that consumer's buying impulse is significantly associated with impulse buying behavior (Beatty & Ferrell, 1998; Youn & Faber, 2000). Therefore, consumer's increased sudden urge to buy a certain product deal should be significantly associated with impulse buying decision.

H9: Consumers in high level of buying impulse will make more impulse buying decisions than those in low level of buying impulse.

Interaction Effects of Scarcity Conditions

This study predicts interaction effects of the two scarcity conditions on consumer's responses. It is predicted that providing a promotional offer with both decision time and product quantity scarcity conditions will produce stronger responses by consumers than providing an offer that features only one condition. We believe that presence of in-store promotion offer under both scarcity conditions will accelerate the effect of consumer's responses. The interaction between a decision time constraint and a limited product quantity should increase propensity to experience arousal and sense of competition, and result in more buying impulse. Therefore, it is predicted that consumers exposed to an in-store promotional offer with both higher levels of scarcity conditions will manifest greater buying impulse, arousal, and perceived competition than lower level scarcity conditions. See figures 2 and 3 for proposed model.

H10: Under the high decision time scarcity condition, consumers exposed to the high level of product scarcity condition will exhibit greater buying impulse than those exposed to the low level of product scarcity condition.

H11: Under the high decision time scarcity condition, consumers exposed to the high level of product scarcity condition will exhibit greater perceived arousal than those exposed to the low level of product scarcity condition.

H12: Under the high decision time scarcity, consumers exposed to the high level of product scarcity condition will exhibit greater perceived competition than those exposed to the low level of product scarcity condition.

Table 1 Independent, Dependent Variables of Each Hypothesis & Scales of Measure

	Independent Variable		Dependent Variable	
		Scales of measure		Scales of measure
H1 (a)	Decision Time Scarcity	Ordinal	Buying Impulse	Interval
H1 (b)			Impulse Buying Decision	Categorical
H2 (a)	Product Scarcity	Ordinal	Buying Impulse	Interval
H2 (b)			Impulse Buying Decision	Categorical
H3	Decision Time Scarcity	Ordinal	Perceived Arousal	Interval
H4	Product Scarcity	Ordinal	Perceived Arousal	Interval
H5 (a)	Perceived Arousal	Interval	Buying Impulse	Interval
H5 (b)			Impulse Buying Decision	Categorical
H6	Product Scarcity	Ordinal	Perceived Competition	Interval
H7 (a)	Perceived Competition	Interval	Buying Impulse	Interval
H7 (b)			Impulse Buying Decision	Categorical
H8	Perceived Competition	Interval	Perceived Arousal	Interval
H9	Buying Impulse	Interval	Impulse Buying Decision	Categorical
H10	Decision Time Scarcity & Product Scarcity	Ordinal	Buying Impulse	Interval
H11	Decision Time Scarcity & Product Scarcity	Ordinal	Perceived Arousal	Interval
H12	Decision Time Scarcity & Product Scarcity	Ordinal	Perceived Competition	Interval

Figure 2 The Conceptual Model for the Effect of Two Types of Scarcity on Impulse Buying Responses

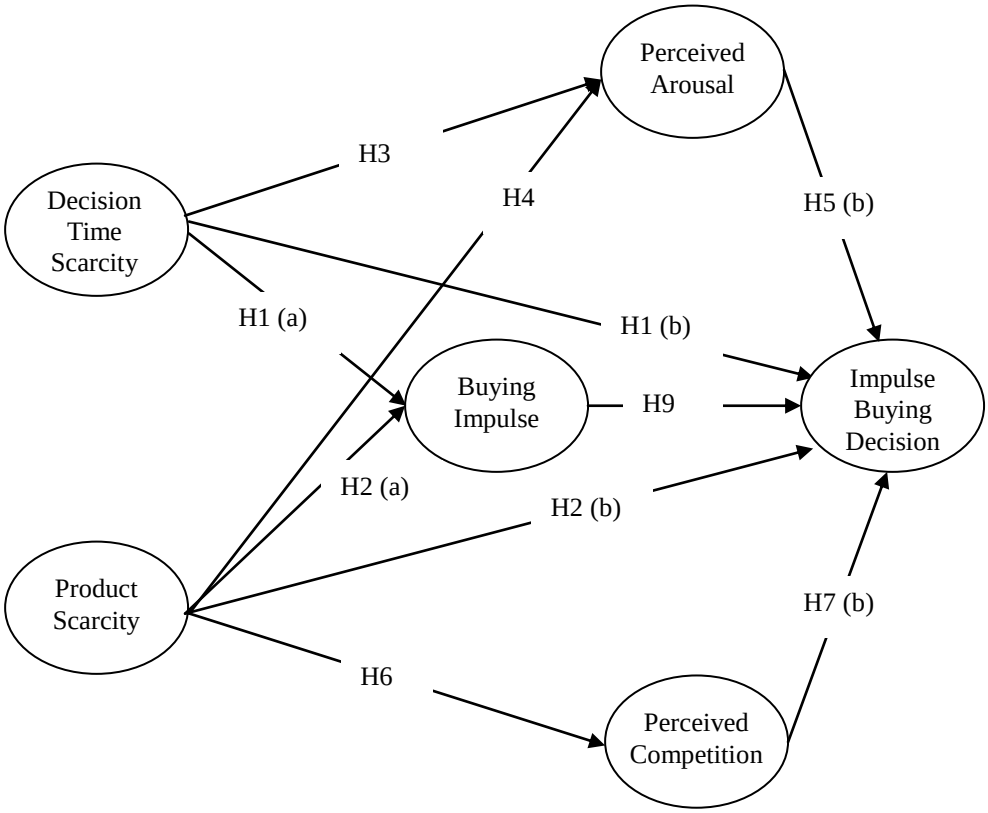
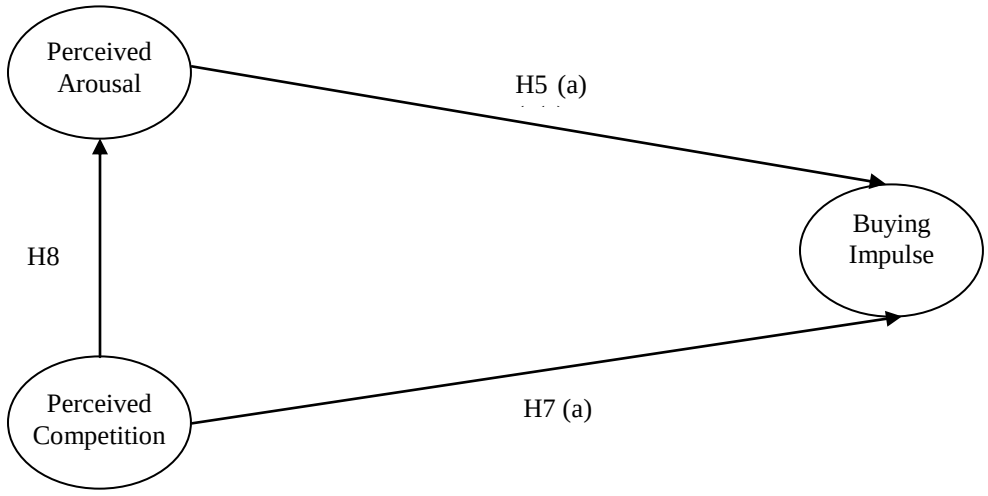


Figure 3 Proposed Causal Relationships



CHAPTER 3 METHODS

This chapter provides the description of the research methods, including data collection procedures, and the data analysis used to test the hypotheses.

Pretest

Stimuli Development

The purpose of the pretest is to ensure the manipulations of treatments elicit the desired effect. The pretest enabled us to identify a more valid level of treatment by evaluating relevance of product selection and price discount level.

Price Discount Level Selection

As indicated earlier, all the hypotheses were developed under the assumption that a product that encourages impulse buying should be attractive and valuable to the participants. As the discount level increases, deal evaluation should also be perceived as attractive (Inman *et al*., 1997). Because previous research confirms that as price discount increases, purchase intention and perceived value of the offer also increase (Alford & Biswas, 2002), this study does not examine the effect of price discount on purchase impulsivity. To avoid the possibility that the effect of scarcity conditions on purchase impulsivity is mediated by high price discount, it is important to find a relevant level of price discount to attract consumers.

Considering an inverted U-shaped explanation of consumer reactions to price discounts (Grewal *et al*., 1996), consumers are more likely to process product information as a price discount moves from a low to moderate level because of the increase of monetary value of the discount. However, when price discount level is high, consumers are less likely to process the

information due to uncertainty of the product value. A 25% price discount is most widely applied as a moderate discount level (Grewal *et al*., 1996; Hardesty &Bearden, 2003). As a result, a 25 percent price discount level was selected. Once price discount level was selected, it was held constant on all conditions.

Product Selection

To select an appropriate product, two conditions were considered. First, the product should be attractive to consumers. In other words, the product must possess a general appeal to have a realistic chance of being purchased (Li, 1995; Lynn, 1991). Second, the product should not be frequently purchased. Of course, frequently purchase products can be impulse items (Kollat & Willett, 1969), however, in this experiment, there is the possibility that frequently purchased products are habitually bought without experiencing an impulse. For example, staples such as bread, milk, eggs might not be attractive as impulse items.

Various items used in experimental research of scarcity effects (Aggarwal *et al*., 2011; Gierl *et al*., 2008) and items likely to be purchased on impulse (Dittmar *et al*., 1995) were considered. Overall, seven different products were selected to be rated as potential impulse items in the pretest: tablet PC, wine, athletic shoes, perfume, sunglasses, travel kit and wristwatch. These seven products with a reduced price were presented to the participants.

Participants were asked three questions:

1) how many of these seven products they currently own

2) purchase intention for each product within the next year

3) product attractiveness with 25 percent price discounts

A survey was administered to rate several different product deals on the aforementioned products on overall attractiveness. 31 participants were recruited through Amazon's Mechanical

Turk. In the pretest, participants were presented with descriptions of seven products, including brief product information, product image, original price, and other product details. Respondents indicated the level of product attractiveness using a seven-point Likert differential scale (e.g., the wine with 25% price discount is: 1=not attractive at all, 7=very attractive).

The pretest results showed that tablet PC was the most attractive product and was initially selected as the stimulus product. However, before the main study, we tested the effect of time and product scarcity on impulse buying for the tablet PC, but there were no scarcity effects. We posited that a tablet PC is too high-priced product to generate consumer's impulse purchase. Because tablet PC is about $400, its high price might prevent the participants' ability to afford it. M-turk participants consist of relatively low-income consumers, thus a high priced product might not be purchased on impulse even though the product might be attractive. Based on the pretest findings, we concluded that even though the tablet PC product is attractive to the consumers, they do not necessarily experience an impulse to purchase that item. So, we needed to select another stimulus product. We concluded that the product in our main study should not be too expensive; around $10-30, and still be attractive to the consumers. During the stimuli selection, we decided to exclude perfume, watch, sunglasses and shoes because these items are regarded as fashion goods, and it is hard to meet a variety of people's tastes in an experiment. We further dropped the travel kit because we conducted another pretest and found that the effect of scarcity was not significant. As a result, wine, which is impulse item (Verplanken & Herabadi, 2001), not gender-sensitive, had a price-ranged from $10-30, and could be stockpiled, was selected as the stimulus product. Because it is possible that simply introducing a product in an in-store promotion might not attract consumers, we decided to introduce the popularity of the product through in-store announcement to increase product attractiveness. We added an in-store

announcement introducing scarcity messages as well as emphasizing product's popularity. We explained the popularity of wine by stating that the wine on promotion is ranked in top 10 wine brands.

Manipulation of Decision Time and Product Scarcity

In a separate pretest, subjects were tested individually to determine a reasonable level of decision time scarcity for low and high levels and relevant numbers of product quantities for low level and high level of scarcity.

A buying scenario depicting a temporary in-store promotion with a price discount was presented. One promotional offer among 4 possible scenarios with two levels of time scarcity (5 minutes vs. 1 hour) and two levels of product scarcity (20items vs. 200 items) were randomly assigned to the participants. Using a seven point semantic differential scale, participants were asked to indicate whether the perceived level of time offer is scarce or abundant. In addition, perceived level of product quantity (scarce or abundant) was also asked using a seven point semantic differential scale. For decision time scarcity, "The time allowed for this wine promotion was.." on a 1-7 scale with end points of "very scarce", and "very abundant" was asked. For product scarcity, "The quantity of wine available was.." on a 1-7 scale with end point of "very scarce", and "very abundant" was assessed.

37 people participated to test decision time scarcity and 51 people participated to test product scarcity. A t-test was calculated to distinguish whether there were mean differences between subjects who were exposed to the two levels of decision time constraint condition and between those who were exposed to the two levels of product scarcity condition. T-test revealed that the mean for the group under high decision time scarcity was (m=2.11), whereas the mean for the group under low decision time scarcity was (m=3.53). The difference (1.42) was

statistically significant at p< .05. The promotion offer with 5 minutes leads to significantly lower perception of sufficient availability of the time offer as compared with the 1 hour. Thus, this time frame represented high/low decision-time scarcity. In addition, another t-test revealed that the groups under high product scarcity (m=2.23) perceived greater scarcity than those under low product scarcity (m=4.48). The difference (2.25) was statistically significant at p< .01. Therefore, 20 items represented high product scarcity and 200 items represented low product scarcity.

Main Study

The purpose of this study was to examine the main effects of decision time and product scarcity on impulse responses. This study also examined the effect of two types of perceived arousal and perceived competition, and further examined the interaction effects of two types of scarcity on consumer's buying responses.

Experimental Design

A 3 (decision time scarcity: 5 minutes *vs.*1 hour *vs.* control (no decision time scarcity)) × 3 (product scarcity: 20 units left vs. 200 units left vs. control (no product scarcity)) between subjects design was used. To acquire the power to detect effectiveness, a minimum of at least 20 subjects per treatment is required (Simmons *et al*, 2011). All the variables are operationalized as between-subjects variables. As a result, we expected to recruit more than 180 participants in this experiment. This study was designed as an online experiment. Hypothetical buying scenarios reflecting nine conditions were developed (Table 2).

Costco was chosen as store stimulus and was selected because it is the 4th largest retailer in the U.S., operating 459 locations in 43 U.S. states and Puerto Rico, and possessing 72.1 million members in 2013 U.S. (*Costco Investor Profile*, 2014). Costco carries a wide assortment of food,

apparel and general merchandise, offered in a warehouse club format, thus it is likely that subjects would be familiar with this retailer. The scenario asked the participants to imagine that they purchased several planned products in their weekly shopping at Costco. After they finished buying the products on their list, they encountered a wine promotion under scarcity condition through an in-store announcement (See Appendix).

Two levels of decision time scarcity and control conditions were implemented, either very short or somewhat short or no scarcity. In addition, two levels of product scarcity and control conditions implemented, either very scarce or somewhat scarce or no product scarcity. Except for the 9 different scarcity conditions, everything including price discount, product information, and product image were kept constant.

Because we wanted to ensure that there was no possibility of potential confounding from brand effect, we decided to use an already established brand to increase product attractiveness. "Robert Mondavi" was selected as the wine brand. It is produced in the U.S. and ranked 4th in the top ten wine brands in 2012 (*the drink business.com, 2013*). To increase product attractiveness, we added an in-store announcement introducing scarcity messages as well as emphasizing product's popularity. Wording for emphasizing product popularity was "one of top ten wine brands in 2012".

Table 2 Main Study Experimental Conditions: Decision Time Scarcity × Product Scarcity

Conditions	Decision time scarcity	Product scarcity
1	5 minutes	20 items
2	5 minutes	200 items
3	1 hour	20 items
4	1 hour	200 items
5	5 minutes	Control
6	1 hour	Control
7	Control	20 items
8	Control	200 items
9	Control	Control

Procedure

The experiment was conducted online. Participants were recruited from Amazon.com's Mechanical Turk (MTurk), a promising interface holding an online panel representing the U.S. population (Berinsky*et al*., 2012). Experimental survey responses were recorded in an online survey software (Qualtrics). MTurk participants were rewarded at the rate of $0.5 per completed and verified survey. Once participants clicked the URL connecting to the experiment, participants were randomly assigned to 1 of 9 conditions (see Table 2). On the first webpage, participants were asked to read a consent form and click yes if they wished to participate in the study. Each respondent was assigned to one of nine versions of a hypothetical buying scenario.

There were instructions to ask participants to imagine that they are in Costco. Then they were presented wine on in-store promotion, offered at a reduced price, with 1 of 9 treatment conditions. An image of products and brief product information were also provided with the buying scenario (See Appendix).

After reading this scenario, participants completed the questionnaire, which included the perceived arousal, perceived competition, and purchase impulsivity scales. In the next section, they rated the manipulation check, answered questions regarding the products and demographics.

Dependent Variables

Perceived Arousal

To measure perceived arousal, a -24item scale, developed by Anderson *et al*. (1995) was adopted (e.g. active; excited). 14 items of 24 items were reverse coded (e.g., depressed). All items were measured using seven-point rating scales (e.g., 1= Does not describe how I feel at all, 7= Accurately describe how I feel).The Cronbach's alpha for the perceived arousal scale in the

original scale Anderson *et al*.(1995) was .94.

After 14 items of 24 items were reverse-scored, principal component analysis (PCA) with varimax rotation was conducted to reduce the complexity in perceived arousal scale in this study. In the first PCA, three factors with eigenvalues equal to or greater than 1.0 were extracted. 14 items loaded strongly on factor 1, which was named "negative arousal". 9 items loaded strongly on factor 2, which was named "positive arousal". 1 item loaded on factor 3, which was named "assertive arousal". Among three factors, the second factor was evaluated to be the best reflection of stimulated emotion in a positive way. Therefore, the second factor was selected to use for hypotheses testing (See Table 3). As a result, 9 items including adjectives "active", "sharp", and "alert" were selected as perceived arousal in this study.

Perceived Competition

Perceived competition was measured with 3- items, adopted from Aggarwal *et al*. (2011), using seven-point Likert-type scale. (e.g. "I may lose the opportunity to purchase the product if others buy it first"). The Cronbach's alpha for the perceived competition scale in Aggarwal *et al*. (2011) was .84. There were some changes in wording of items for this study (e.g., there is a lot of competition from other buyers to purchase the advertised product → there is a lot of competition from other buyers to purchase this product).

Table 3 Principal Component Factor Analysis for Perceived Arousal Scale

Factors/ Factor items	Factor loadings	Eigenvalue	Percentage of variance	Cronbach's alpha
Factor 1: Negative arousal		8.544	35.602	.949
Depressed	.551			
Drowsy	.798			
Dull	.616			
Exhausted	.808			
Sluggish	.863			
Tired	.874			
Weak	.747			
Weary	.740			
Fatigued	.808			
Inactive	.732			
Quiet	.609			
Sleepy	.882			
Slow	.858			
Worn-out	.888			
Factor 2: Positive arousal		6.403	26.677	.940
Active	.850			
Energetic	.891			
Excited	.833			
Lively	.908			
Sharp	.858			
Vigorous	.782			
Alert	.787			
Aroused	.649			
Powerful	.808			
Factor 3: Assertive arousal		1.277	5.391	
Forceful	.557			

Buying Impulse

A modification of Rook and Fisher's (1995) buying impulsiveness was adapted ("I would buy this product spontaneously" is a sample item from this scale; see Table 7). Two items out of the nine-items original scale (i.e. Sometimes I am a bit reckless about what I buy) were deleted because they were not appropriate to the shopping condition in this study. There were some changes in wording of items for this study to reflect state level of impulsiveness (e.g., Just do it

describes the way I buy things → Just do it describes this product deal). All items in buying impulse measured on a 7-point Likert scale (1=strongly disagree, 7=strongly agree). The Cronbach's alphas for the buying impulsiveness scale in the original Rook and Fisher (1995) scale were .88 and .82.

Impulse Buying Decision

Because the act of impulse buying can be distinguished by whether an item is chosen or not, we will not rate actual impulse buying with a Likert type scale. Only one item will be asked with Yes or No answer; "I will purchase this product". This measure takes on the value of 1 for chosen and 0 not chosen. See Table 7 for all construct measures.

Demographic Information

Participant's demographic information was measured with gender, age, marital status, number of children, ethnicity, education, employment status and household income (see Table 4).

CHAPTER 4 RESULTS

Analyses of Results

Data were analyzed using SPSS and AMOS. Descriptive statistics, analysis of variance (ANOVA), factorial analysis of variance (factorial ANOVA), logistic regressions, and path analysis were conducted. Descriptive statistics were computed for each variable including demographics, perceived arousal, perceived competition, buying impulse, and impulse buying decision.

To test H1 (a), H2 (a), H3, H4, H6, separate one-way Analyses of variance (ANOVA) was employed. ANOVA determined the effects of decision time and product scarcity on perceived arousal, perceived competition, and buying impulse. To test causal relationships of H5 (a), H7 (a), and H8, path analysis in structural equation modeling was employed. Path analysis determined the relationship between perceived arousal and perceived competition, the relationship between perceived arousal and buying impulse, and the relationship between perceived competition and buying impulse. To test H1 (b), H2 (b), H5 (b), H7 (b), and H9, logistic regressions were employed. To test H10, H11 and H12, factorial Analysis of variance (factorial ANOVA) was performed. 2-way ANOVA determined the effect of two scarcity conditions on perceived arousal, perceived competition, and buying impulse. Bonferroni post-hoc tests were conducted to examine any interaction effect.

Preliminary Analyses

Data from the 11 of the questionnaires were considered to be insufficient, as respondents did not finish the questionnaire. After excluding questionnaires with missing data, 666 usable responses were comprised from a total 677 responses. Because this study used an alcoholic

beverage (wine) as a product stimulus, we excluded participants under age 22. A total 594 was remained in the final sample. All data were directly captured into the Qualtrics database.

Characteristics of the Participants

Overall, 594 participated in the study. 59.4% of respondents were male. Participants ranged from 22 to 74 years of age, with an average age of 32. Approximately 74% of the participants were Caucasian. Other participants were Asian (12.1%), African American (5.2%), Hispanic (4.5%), American Indian (0.7%), and Native Hawaiian (0.3%). More than half of the respondents (58.7%) earned at least a college-degree or advanced-degree. 8.2% of the respondents were college students. 18.2% of the respondents' incomes were less than $20,000 (See Table 4). M-turk workers were more educated than the general U.S. population, with 58.7% having a college degree vs. the U.S. population (38.06%) (*U.S. Census Bureau, 2013*). In addition, M-turk workers had a relatively higher unemployment rate (18.5%) than the general U.S. population (7.8%) (*U.S. Census Bureau, 2012*). Therefore, we concluded that M-turk participants are only somewhat representative of the general U.S. population. These differences from the general U.S. population might result from using the Internet Website as a research platform that male and more educated people are more familiar with computer-technology (Sherman *et al*., 2000). Accordingly, M-turk workers might be representative of the U.S. Internet using population (Ross *et al*., 2010).

Manipulation Checks

The manipulation check indicates a successful manipulation of the scarcity condition. The survey included a set of questions to verify whether the participants in the high level of decision time scarcity (5 minutes) perceived time as more scarce than those in the low level of decision time

scarcity (1 hour), and whether those in the high level of product scarcity (20 bottles) perceived product quantity as more scarce than those in the low level of product scarcity (200 bottles). As expected, t-test revealed that the mean for the group in the high decision time scarcity condition

Table 4 Demographics of Participants

		Frequency	Sample Percentage
Gender			
	Male	353	59.4
	Female	241	40.6
Age			
	22-24	141	23.7
	25-29	183	26
	30-34	99	16.6
	35-39	51	8.6
	40-44	33	5.5
	Over 45	87	19.6
Marital Status			
	Never Married	352	59.3
	Married	184	31.0
	Divorced	40	6.7
	Separated	6	1.0
	Others	12	2.0
Number of Children			
	No Children	405	68.2
	1	82	13.8
	2	71	12.0
	More than 2	36	6.1

Table 4 (cont'd)

		Frequency	Sample Percentage
Ethnic Background			
	American Indian and Alaska Native	4	0.7
	Asian	72	12.1
	Black or African American	31	5.2
	Caucasian/White	437	73.6
	Hispanic	27	4.5
	Native Hawaiian and other Pacific Islander	2	0.3
	Some other race (Please specify)	4	0.7
	Two or more races	12	2.0
	Rather not say	5	0.8
Education			
	Some High School	5	0.8
	High School	56	9.4
	Some College	181	30.5
	College Degree	283	47.6
	Graduate Degree	66	11.1
	Don't want to answer	3	0.5
Employment Status			
	Not employed	110	18.5
	Self-employed	101	17.0
	Works for someone else, part time	75	12.6
	Works for someone else, full time	259	43.6
	Full time student	49	8.2
Household Income			
	$20,000 or less	108	18.2
	$20,001 - $39,999	162	27.3
	$40,000 - $59,999	131	22.1
	$60,000 -$79,999	85	14.3
	$80,000 -$99,999	41	6.9
	$100,000 -$119,999	24	4.0
	$120,000 or more	24	4.0
	I do not know	3	0.5
	I prefer not to answer	16	2.7

(m=2.27) was significantly different from the mean for the group in the low decision time scarcity condition (m=3.65). The difference (1.38) was statistically significant at p< .0001. The promotion offer with 5 minutes leads to significantly lower perception of sufficient availability of the time offer as compared with the 1 hour promotion offer.

Another t-test revealed that the groups in the high product scarcity condition (m=3.37) perceived greater scarcity than those in the low product scarcity condition (m=4.56). The difference (1.19) was statistically significant at p< .001. The promotion offer with 20 bottles of wine leads to significantly lower perception of sufficient availability of product quantity as compared with the 200 bottle promotion offer. Both manipulation checks were successful (See Table 5).

Table 5 Manipulation Checks

		Mean	F	P
Decision time scarcity	5 minutes	2.27	11.490	0.000
	1 hour	3.65		
Product scarcity	20 bottles	3.37	8.591	0.000
	200 bottles	4.56		

Reliability and Validity of the Measurement

To examine measurement properties, we conducted confirmatory factor analysis (CFA). We used Amos with maximum likelihood estimation. Construct validity for each scale was assessed by examining the standardized CFA factor loadings of its hypothesized items. For acceptable construct validity, it is suggested that each item should exceed factor loading of 0.60 on its hypothesized construct. This norm was met for 1 out of 19 items for the three constructs. The item (in the buying impulse scales) had loading of 0.54, but was significant at p< 0.01 and was therefore remained in the measurement model.

The first step in model testing was to estimate the goodness-of-fit of the hypothesized research model. This is typically done using a chi-square test; however such tests are sensitive to sample sizes and the probability of rejecting any model increases as sample size increases, even when the model is minimally false. Hence, Bentler and Bonnett (1980) suggest x^2/df ratio as a more appropriate measure of model fit. This ratio should not exceed 5 for models with good fit, and estimated as 2.57 in our causal model. The other CFA results indicated that the fit indices showed an acceptable fit of the model to the data: CFI=.974; GFI=.935; AGFI=.914; NFI= .961; RMSEA=.056.

To examine whether the observed variables are associated with the latent factor, a reliability test was conducted (Nunally, 1978). Cronbach's alpha was assessed. Reliability for perceived arousal was .94, perceived competition was .93, and buying impulse was .93. Nomological validity was demonstrated by significant correlations between the hypothesized constructs. The correlations between constructs are shown in Table 6. Next, convergent and discriminant validity tests were conducted. Convergent validity was tested to confirm that variables are not strongly correlated within the parent factor. Based on the results from the measurement model, composite reliability (CR) and average variance extracted (AVE) were calculated to estimate each construct's internal consistency. The results provided good support for internal consistency, as each CR value was above the cutoff point of .70 (.92~.94) and each AVE value was greater than .50 (.64~.82) (Hair *et al*., 2010). Discriminant validity was tested to confirm that the relationships between measures from different constructs should be low. To test discriminant validity, each maximum shared variance (MSV) and average shared variance (ASV) should be less than AVE. The test results revealed that there was no discriminant validity concern (See Table 7).

Table 6 Correlations between Constructs Following Confirmatory Factor Analysis

	PA	**PC**	**BI**
PA	1		
PC	.374**	1	
BI	.476**	.594**	1

PA: perceived arousal; PC: perceived competition; BI: buying impulse
**p < .001

Table 7 Convergent and Discriminant Test Calculations

	CR	**AVE**	**MSV**	**ASV**
PA	.930	.815	.384	.271
PC	.941	.643	.263	.210
BI	.921	.637	.384	.324

PA: perceived arousal; PC: perceived competition; BI: buying impulse

Table 8 Measurement Items (Factor Loadings and Alpha)

Constructs	Items	Std. Factor loading	alpha
Perceived Arousal (9 items) *(Anderson et al., 1995)*	Please indicate how you feel at this moment. • Active • Energetic • Excited • Lively • Sharp • Vigorous • Alert • Powerful *Excluded items: depressed, drowsy, dull, exhausted, forceful, sluggish, tired, weak, weary, fatigued, inactive, quiet, sleepy, slow, worn-out, aroused*	 .834 .888 .841 .913 .825 .744 .739 .775	.94
Perceived Competition (3 items) *(Aggarwal et al., 2011)*	Please indicate how you feel at this moment • I think I might lose the opportunity to purchase the product if other bought it first • I feel there is a lot of competition from other buyers to purchase this product (reworded). • In order to get this deal, I think I have to make the purchase before others do (reworded)	 .902 .905 .902	.93
Buying Impulse (7 items) *(Rook & Fisher, 1993)*	Please indicate how you feel at this moment • I would buy this product spontaneously (reworded) • "Just do it" describes this product deal (reworded) • I would buy this product without thinking (reworded) • "I see it, I buy it" describes this product deal (reworded) • "Buy now, think about it later" describes this product deal (reworded) • I feel like buying this product on the spur of the moment (reworded) • Based on how I feel at this moment, I would buy this product (reworded) *Excluded items: I carefully plan most of my purchase; Sometimes I am a bit reckless about what I buy*	 .945 .599 .908 .651 .498 926 925	.93
Impulse Buying Decision	Will you purchase wine? • Yes/ No		

Hypotheses Testing

Test of H1 (a)

H1 (a) asserted that consumers exposed to the high level of decision time scarcity condition will exhibit greater buying impulse than those exposed to the low level of scarcity and no decision time scarcity condition. Means of buying impulse was compared using a one-way ANOVA to test H1 (a). No significant difference was found ($F(2, 591) = .098$, $p > .05$) (See Table 9). Consumers exposed to three different conditions in time scarcity did not differ significantly in buying impulse. Therefore, H1 (a) was not supported.

Table 9 ANOVA Results: The Effect of Decision Time Scarcity on Buying Impulse

	Decision Time Scarcity				
	5 minutes	1 hour	No decision time scarcity	F	p
Buying Impulse	3.12	3.06	3.06	.098	.906

Test of H1 (b)

H1 (b) predicted that consumers in a high level of decision time scarcity will make more impulse buying decisions. To test H1 (b), logistic regression was used in the analysis because the dependent variable is a dichotomous variable (Purchase/ Not purchase). Goodness-of-fit test-Hosmer-Lemeshow test that yielded a χ^2 (1) of .988 was insignificant ($p > .05$), suggesting that the proposed model fit the data well. The regression results showed that decision time scarcity has no impact on impulse buying decision (See Table 10). People in a high level of decision time scarcity did not purchase more wine on impulse than those in low level of decision time scarcity or non-scarcity condition. Scarcity in decision time did not affect a consumer's impulse purchase

decision. Therefore, H1 (b) was not supported.

Table 10 Logistic Regression Result for the Impact of Decision Time Scarcity on Impulse Buying Decision

Variable	Estimate	Standard error	Wald chi-square	P	Exp(B)
Decision Time Scarcity	-.147	.116	1.625	.202	1.159
Constant	-.861	.145	35.344	.000	.423

Test of H2 (a)

H2 (a) stated that consumers exposed to the high level of product scarcity condition will exhibit greater buying impulse than those exposed to the low level of product scarcity condition and no product scarcity condition. Means of buying impulse was compared using a one-way ANOVA to test (a). Our results show that a significant difference was found among the product scarcity conditions ($F(2, 591) = 7.010$, $p < .005$). Bonferroni's post hoc analysis was used to determine the nature of the differences between the scarcity conditions. This analysis revealed that groups in high level of product scarcity condition exhibited higher buying impulse (m_ buying impulse = 3.38, sd = 1.67) than consumers in no product scarcity condition (m_ buying impulse = 2.79, sd = 1.49), but not low level of product scarcity. The group in low level of product scarcity (m_ buying impulse = 3.05, sd = 1.55) was not significantly different from either of high-scarcity and no product scarcity groups (See Table 11). Therefore, H2 (a) was supported.

Table 11 ANOVA Results: The Effect of Product Scarcity on Buying Impulse

	Product Scarcity				
	20 bottles	200 bottles	No product scarcity	F	p
Buying Impulse	3.38	3.05	2.79	7.010	.001

Test of H2 (b)

H2 (b) proposed that consumers exposed to the high level of product scarcity will make more impulse purchases decisions than those exposed to the no product scarcity condition and the low level of product scarcity condition. To test H2 (b), logistic regression was used. Goodness-of-fit test- Hosmer-Lemeshow test that yielded a χ^2 (1) of .623 was insignificant ($p > .05$), suggesting that the proposed model fit the data well. The regression results showed that product scarcity has a positive impact on impulse buying decision (See Table 12). Consumers in high level of product scarcity made more impulse purchases than no product scarcity group and low level of product scarcity group. Therefore, H2 (b) was supported.

Table 12 Logistic Regression Result for the Impact of Product Scarcity on Impulse Buying Decision

Variable	Estimate	Standard error	Wald chi-square	P	Exp(B)
Product Scarcity	.340	.115	8.694	.003	.712
Constant	-1.372	.160	73.344	.000	.253

Test of H3

H3 asserted that consumers exposed to the high level of decision time scarcity condition will exhibit greater perceived arousal than those exposed to the low level of decision time scarcity condition and no decision time scarcity condition. Means of perceived arousal were

compared using a one-way ANOVA. Our results show that there is a significant difference between the decision time scarcity conditions ($F(2, 591) = 5.445$, $p < .05$). Bonferroni's post hoc analysis was used to determine the nature of the differences between the scarcity conditions. This analysis revealed that groups in a high level of decision time scarcity exhibited higher perceived arousal (m_perceived arousal = 3.08, sd = 1.41) than groups in non-scarcity condition (m_ perceived arousal = 2.66, sd = 1.52). Group in a low level of decision time scarcity (m_ perceived arousal = 3.09, sd = 1.40) was not significantly different from either high-scarcity and non-scarcity groups (See Table 13). Therefore, H3 was supported.

Table 13 ANOVA Results: The Effect of Decision Time Scarcity on Perceived Arousal

	Decision Time Scarcity				
	5 minutes	1 hour	No decision time scarcity	F	p
Perceived Arousal	3.08	3.09	2.66	5.445	.005

Test of H4

In H4, we postulated that consumers exposed to the high level of product scarcity will exhibit greater perceived arousal than those exposed to the low level of product scarcity and no product scarcity condition. Means of perceived arousal were compared using a one-way ANOVA. No significant difference was found ($F(2, 591) = 1.167$, $p > .05$) (See Table 14). Consumers exposed to the three different conditions in product scarcity did not differ significantly in perceived arousal. Therefore, H4 was not supported.

Table 14 ANOVA Results: The Effect of Product Scarcity on Perceived Arousal

	Product Scarcity				
	20 bottles	200 bottles	No product scarcity	F	p
Perceived Arousal	3.07	2.90	2.87	1.167	.408

Test of H5 (b)

H5 (b) asserted that consumers in a high level of perceived arousal will make more impulse buying decisions than those in low level of perceived arousal. To test, H5 (b), logistic regression was used. Goodness-of-fit test- Hosmer-Lemeshow test that yielded a χ^2 (8) of 12.638 was insignificant ($p > .05$), suggesting that the proposed model fit the data well. The regression results showed that product scarcity has a positive impact on impulse buying decision (See Table 15). Consumers in high level of perceived arousal made more impulse purchases than low level of perceived arousal. Therefore, H5 (b) was supported.

Table 15 Logistic Regression Result for the Impact of Perceived Arousal on Impulse Buying Decision

Variable	Estimate	Standard error	Wald chi-square	P	Exp(B)
Perceived Arousal	.745	.077	92.906	.000	.475
Constant	-3.440	.291	139.769	.000	.032

Test of H6

H6 asserted that consumers in a high level of product scarcity will exhibit greater perceived competition than those in a low level of product scarcity and no product scarcity. Means of perceived competition were compared using a one-way ANOVA. Our results show that

a significant difference was found among the product scarcity conditions (F (2, 591) = 26.650, p< .001). Bonferroni's post hoc analysis was used to determine the nature of the differences between the scarcity conditions. This analysis revealed that groups in high level of product scarcity exhibited higher perceived competition (m_perceived competition = 4.06, sd = 1.71) than groups in non-product scarcity condition (m_ perceived competition = 2.88, sd = 1.68). However, while groups in low level of product scarcity (m_ perceived competition = 3.74, sd = 1.58) was different from non-scarcity group, it was not different from high level of product scarcity (See Table 16). Therefore, H6 was supported.

Table 16 ANOVA Results: The Effect of Product Scarcity on Perceived Competition

	Product Scarcity				
	20 bottles	200 bottles	No product scarcity	F	p
Perceived Competition	4.06	3.74	2.88	26.650	0.000

Test of H7 (b)

H7 (b) asserted that consumers in a high level of perceived competition will make greater impulse buying decisions than those in low level of perceived competition. To test H7 (b), logistic regression was used. Goodness-of-fit test- Hosmer-Lemeshow test that yielded a χ^2 (8) of 10.253 was insignificant (p > .05), suggesting that the proposed model was fit to the data well. The regression results showed that perceived competition has a positive impact on impulse buying decision (See Table 17). Consumers in high level of perceived competition made more impulse purchases than low level of perceived arousal. Consumers in high level of perceived competition made greater impulse purchases than low level of perceived competition. Therefore,

H7 (b) was supported.

Table 17 Logistic Regression Result for the Impact of Perceived Competition on Impulse Buying Decision

Variable	Estimate	Standard error	Wald chi-square	P	Exp(B)
Perceived Competition	.822	.078	109.827	.000	.440
Constant	-4.352	.368	141.348	.000	.013

Test of H9

H9 asserted that consumers in high level of buying impulse will make more impulse buying decisions than those in low level of purchase impulsivity. To test H9, logistic regression was used. Goodness-of-fit test- Hosmer-Lemeshow test that yielded a χ^2 (8) of 4.412 was insignificant ($p > .05$), suggesting that the proposed model fit the data well. The results showed that buying impulse has a positive impact on impulse buying decision (See Table 18). Consumers in high level of buying impulse made more impulse purchases than low level of buying impulse. Therefore, H9 was supported.

Table 18 Logistic Regression Result for the Impact of Buying Impulse on Impulse Buying Decision

Variable	Estimate	Standard error	Wald chi-square	P	Exp(B)
Buying Impulse	2.427	.225	120.412	.000	.084
Constant	-10.284	.910	127.665	.000	.000

Interaction Effects

Test of H10

H10 stated under the high decision time scarcity condition, consumers exposed to the high level of product scarcity condition will exhibit greater buying impulse than those exposed to the low level of product scarcity condition. To test H10, factorial ANOVA was conducted. In this analysis, the independent variables were decision time and product scarcity and the dependent variable was buying impulse. The results showed that there was no significant interaction effect for decision time scarcity and product scarcity on buying impulse, $F(4) = .666$; $p > .01$ (See Table 19). Therefore, H10 was not supported.

Test of H11

H11 predicted that under the high decision time scarcity condition, consumers exposed to the high level of product scarcity condition will exhibit greater perceived arousal than those exposed to the low level of product scarcity condition. To test H11, factorial ANOVA was performed. In this analysis, the independent variables were decision time and product scarcity and the dependent variable was perceived arousal. The result showed that there was a significant interaction effect for decision time and product scarcity on perceived arousal, $F(4) = 5.66$; $p < .001$ (See Table 19). Therefore, H11 was supported.

Test of H12

H12 predicted that under a high decision time scarcity, consumers exposed to the high level of product scarcity condition will exhibit greater perceived competition than those exposed to the low level of product scarcity condition. To test H12, factorial ANOVA was performed. In

this analysis, the independent variables were decision time and product scarcity and the dependent variable was perceived competition. The result showed that there were no significant interactions effect for decision time and product scarcity on perceived competition, F (4) = .949; p > .01 (See Table 19). Therefore, H12 was not supported.

Table 19 Summary of ANOVA Results

Source	Decision time scarcity		Product scarcity		Decision time scarcity × Product scarcity	
	F	p	F	p	F	p
Buying impulse	.113	.113	6.750	.001	.666	.616
Perceived arousal	5.004	.007	1.549	.213	5.660	.000
Perceived competition	2.692	.069	27.211	.000	.949	.435

Causal Relationships: Test of H5 (a), H7 (a), and H8

In order to examine the relationships among the independent variable and dependent variables, we conducted structural equation modeling (SEM). SEM shows the causal relationships of one independent variable and three dependent variables. Before proceeding with path analysis, we first tested the measurement model with Confirmatory Factor Analysis (CFA) and then we estimated a structural model (Anderson & Gerbing, 1988). CFA results were reported earlier in this chapter.

Path analysis was conducted by a maximum-likelihood estimation procedure using AMOS (Analysis of Moment Structure) to examine causal relations among variables. The conceptual model consists of one exogenous variable (perceived competition) and two endogenous variables (perceived arousal and buying impulse) To assess model fit, x^2/df ratio, goodness-of-fit index (GFI), adjusted relative fit index (AGFI), normed fit index (NFI), relative fit index (RFI), and

root mean square error of approximation (RMSEA) were used. As an indicator of good model fit to the data, Kline's (1998) criteria were adopted (e.g. CFI ≥ .90, GFI ≥ .90, AGFI ≥ .90, NFI ≥ .90, RMSEA ≤ .06). The results of causal model analysis revealed a chi-square of 408.157 (p= .000) with 144 degree of freedom. The x^2/df ratio was 2.83. The other fit indices were CFI= .974, GFI = .935, AGFI = .914, NFI = .961, and RMSEA = .056. As the results were indications of acceptable fit, we can conclude that the structural model is acceptable.

H5 (a) predicted that there is a positive relationship between perceived arousal and buying impulse. In this analysis, the independent variable was perceived arousal and the dependent variable was buying impulse. The proposed relationship between perceived arousal and buying impulse was supported (β = .317, p < .001) (See Table 20). People who felt more perceived arousal were likely to experience greater buying impulse.

H7 (a) asserted that there is a positive relationship between perceived competition and buying impulse. In this analysis, the independent variable was perceived competition and the dependent variable was buying impulse. The results showed that perceived competition was significantly related to buying impulse (β = .494, p < .001) (See Table 20). People who felt more perceived competition were likely to experience greater buying impulse. Therefore, H7 (a) was supported. Based on the standardized weights of the variables, perceived competition was the more important in predicting buying impulse, β= .494 as compared to perceived arousal β= .317.

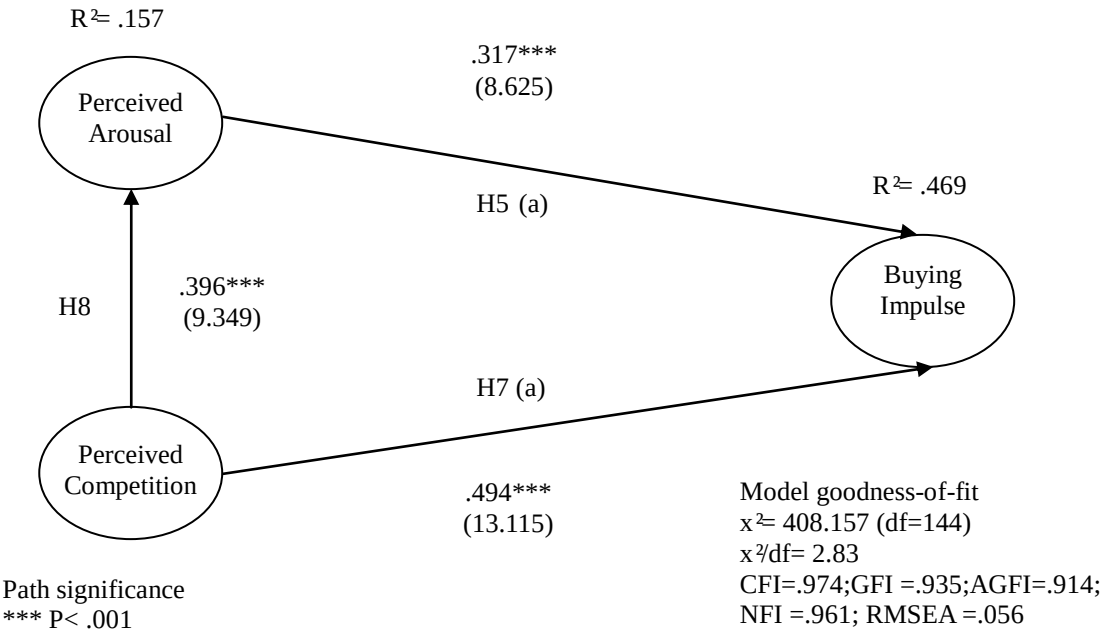
H8 asserted that there is a positive relationship between perceived competition and perceived arousal. In this analysis, the independent variable was perceived competition and the dependent variable was perceived arousal. The result showed the relationship of perceived arousal to perceived competition (β = .396, p < .001) (See Table 20). Therefore, H8 was supported.

Table 20 Structural Estimates

Hypotheses	IV	DV	Standardized regression estimates	S.E.	C.R.	P
5 (a)	Perceived arousal	Buying impulse	.317	.044	8.625	***
7 (a)	Perceived competition	Buying impulse	.494	.040	13.115	***
8	Perceived competition	Perceived arousal	.396	.038	9.349	***

*** P value < .001

Figure 4 Path Model



CHAPTER 5 DISCUSSIONS

The objective of this dissertation was to examine the effects of decision time and product scarcity on impulse buying responses. This study also examined the effect of two types of scarcity on perceived arousal and perceived competition, and examined their relationships to impulse buying responses. In addition, this study further examined the interaction effects of two types of scarcity on the consumer's buying responses.

The following section contains a summary of key findings of this study and discussion about the meanings of the findings.

The Effect of Decision Time Scarcity on Impulse Buying Responses

Our study did not reveal main effects for decision time scarcity on buying impulse and impulse buying decision. There was no difference in buying impulse between high vs. low level of decision time scarcity and high vs. non-decision-time scarcity condition (control). Therefore, time restriction on the price reduced promotion did not temporarily increase buying impulse or impulse purchase decisions. Decision time scarcity may not be an important influence on consumer's impulse buying in an in-store shopping context.

There are two possible explanations for the lack of effect of decision time scarcity on impulse buying variables. First, scarcity in decision time may not be a major trigger on impulse buying. According to Aggarwal *et al*. (2011), limited-quantity scarcity (LQS) was more effective in eliciting purchase intention than limited-time scarcity (LTS). They suggested that LQS is more effective than LTS because consumers do not compete with each other in LTS condition, and our results are consistent with these prior results. Because the existence of a promotion deadline indicates anyone can possess the product if they finish buying within the deadline, time scarcity

might be weak stimulus to elicit consumer's fear of product unavailability. Perhaps obtaining an unplanned item under time scarcity does not increase perceived value to the consumer. Our findings indicate that time scarcity is not sufficient to encourage impulse buying.

Another explanation is that decision time scarcity might not be manipulated well. Manipulation checks confirmed that respondents in high level exhibited greater perceived scarcity in time than those in low condition. However, it is possible that people could cognitively perceive scarcity in time but could not psychologically perceive time scarcity in reality. Because this study was conducted in scenario-based experiment, it is possible that scarcity in decision time is not perceived as realistic. Using actual time scarcity in a field experiment could test this explanation.

The Effect of Product Scarcity on Impulse Buying Responses

As expected, there was an effect of product scarcity on impulse buying responses. Consumers exposed to product scarcity exhibited greater buying impulse than a non-product scarcity condition. In addition, people exposed to high product scarcity made more impulse buying decisions than non-product scarcity. These results are consistent with Aggarwal *et al*. (2011), Byun and Sternquist (2008), and Wu *et al*. (2012) that product scarcity accelerates purchase intention. However, post hoc analyses indicated that the differences come from a high level of product scarcity and non-product scarcity. Even though the data showed the expected pattern, there was no statistical difference in buying impulse between high level of product scarcity and low level of product scarcity, or between low level of product scarcity and non-product scarcity. A high level of product scarcity was more likely to influence buying impulse than non-product scarcity. Therefore, it is suggested that consumer's buying impulse can be temporarily increased by an external factor such as marketer's point of purchase (POP) message

of limited product quantities.

The results demonstrate that the effects of two types of scarcity on impulse buying responses, the roles of decision time and product scarcity messages are different. Time scarcity does not directly influence impulse buying while product scarcity is able to directly influence impulse buying. Our results show that between the two types of scarcity, product scarcity is a more effective factor encouraging impulse buying than decision time scarcity.

The Effect of Decision Time and Product Scarcity on Perceived Arousal

There was a difference in perceived arousal between a high level of decision time scarcity and non-scarcity condition. However, there was no difference in perceived arousal between high and low level of decision time scarcity. People in the high level of decision time scarcity tended to exhibit a greater sense of urgency than those in non-decision time scarcity. This result indicates that people encountering a limited buying situation exhibited emotional responses (Mehrabian & Russell, 1974). As Freedman and Edwards (1988) suggested that pressure such as limited time period in games or sports, plays a positive role in making people enjoy the activity, people might experience arousal such as enjoyment or excitement in time restricted buying situation. These results were consistent in both time scarcity conditions.

On the other hand, our findings did not support the predictions of the effect of product scarcity on perceived arousal. Scarcity in product quantity itself may not create a sense of urgency. Therefore, it is important to note that between two types of scarcity, perceived arousal is only sensitive to decision time scarcity. This indicates that only time-related buying condition is associated with stimulating people's emotional state.

The Effect of Product Scarcity on Perceived Competition

The results indicated that product scarcity influenced perceived competition. Even though there was no difference in perceived competition between high and low level of product scarcity, there was a difference between high level of product scarcity and non-product scarcity. This result is consistent with previous research in that the urgency to purchase felt among buyers toward the product is increased when there is product scarcity (Aggarwal *et al*., 2011; Cialdini, 1993).

We did not establish a hypothesis of the effect of decision time on perceived competition because we thought only quantity limitation could induce competition between consumers. As expected, there was no effect of decision time scarcity on perceived competition. Based on the results, we concluded that decision time scarcity is related to perceived arousal while product scarcity is related to perceived competition. Each type of scarcity has a different effect on consumer's responses.

Relationship between Perceived Arousal and Buying Impulse

As expected, there was a positive relationship between perceived arousal and buying impulse. Higher scores on perceived arousal are related to higher scores on buying impulse. People in a high level of arousal are likely to focus on immediate pleasure and less likely to resist the temptation of an attractive product (Fedorikhin & Patrick, 2010). Accordingly, consumers in a stimulated emotional state are likely to experience buying impulse.

Relationship between Perceived Competition and Buying Impulse

As expected, there was a positive relationship between perceived competition and buying

impulse. Higher scores on perceived competition are related to higher scores on buying impulse. Consistent with past research (Aggarwal *et al*., 2011; Byun & Sternquist, 2008; Lynn, 1992), consumers who experienced competition between other consumers are more likely to experience an instant, irresistible urge to purchase the product. Perceived competition plays an important role inducing buying impulse as it acts as a signal of potential scarcity.

The Effect of Perceived Arousal and Perceived Competition on Impulse Buying Decisions

As expected, consumers in a high level of perceived arousal were likely to make more impulse buying decisions than those in a low level of perceived arousal. These results support the notion that people in a high level of arousal have difficulty in rational decision-making, as well as they are likely to focus on immediate pleasure in short-term perspective (Fedorikhin & Patrick, 2010). In addition, consumers in a high level of perceived competition were likely to make more impulse buying decisions. People who experienced their buying condition as competitive due to other buyers made more impulse purchases.

Relationship between Perceived Competition and Perceived Arousal

There was a significant relationship between perceived competition and perceived arousal. The positive beta value indicates that higher scores on perceived competition are related to higher scores on perceived arousal. Thus, people who felt more perceived competition were likely to experience greater perceived arousal. Participants who experienced a more competitive buying environment were more likely to experience emotional stimulation. Perceived competition might be another form of scarcity to the consumers. Inducing competition between buyers creates emotional stimulation such as consumer's sense of urgency from the fear of product unavailability, further increases consumer's purchase impulsivity. Because there is no

previous finding examining the relationship between perceived competition and perceived arousal, this might be the first study to examine this relationship.

Relationship between Impulse Buying Responses

As expected, consumers who exhibited high level of buying impulse were likely to make more impulse purchases. Consumers who felt a temporary, increased sudden urge to buy the wine led to buy that product.

Interaction Effects of Decision Time Scarcity and Product Scarcity

The combination of decision time scarcity and product scarcity did not directly influence impulse buying. Presenting two scarcity conditions simultaneously did not directly influence buying impulse or impulse buying. Also, no significant interaction effect for the two types of scarcity conditions on perceived competition was found. The only significant interaction effect was for decision time and product scarcity on perceived arousal. People exposed to a high level of time and product scarcity exhibited greater perceived arousal than those exposed to low level of time and product scarcity. When the promoted product has very limited quantity, existence of a time limitation strongly influences consumer's emotional stimulation. Because there is no previous study examining interaction effects of time and product scarcity, this might be the first study to examine these relationships.

CHAPTER 6 CONCLUSIONS AND IMPLICATIONS

Theoretical Implications

Our study has several theoretical implications. First, we have extended the application of psychological reactance theory (Brehm, 1966) to the understanding of impulse buying behavior in consumer behavior context. Using two types of scarcity tactics as stimuli, we tested whether consumers experience buying impulse as a reactance to restriction of buying freedom. We revealed that only product scarcity, compared to decision time scarcity, has an impact on buying impulse. Reactance in a restricted buying situation, especially in a product scarcity buying condition, might be associated with consumer's buying impulse, which in turn influences impulse buying decision. These findings may support the notion of psychological reactance that product scarcity makes people experience a threat to their buying freedom and they may boost their purchases as a reaction to regain their buying freedom.

Second, the current study contributes to the scarcity effect literature by examining empirically the effect of scarcity tactics on impulse buying behavior. Previous research examining the effect of scarcity tactics has focused on general purchase intention (Aggarwal *et al*., 2011; Bae & Lee, 2005). They did not examine whether scarcity tactics influences felt urge to purchase the product at point of purchase stimuli. While previous findings suggested that both time and product scarcity increase purchase intention (Aggarwal *et al*., 2011; Bae & Lee, 2005), the present study found that only presence of product scarcity in product promotion leads to enhanced buying impulse, which in turn increases impulse buying decisions. Decision time scarcity was not effective to encourage consumer's impulse buying; only product scarcity is able to directly trigger impulse buying. Compared to product scarcity, decision time scarcity might

not be a strong factor that induces consumer's sudden urge to buy. These findings contribute to the existing scarcity principle research by revealing only product scarcity might be an effective factor that increases impulse buying.

Third, these findings contribute to impulse buying literature by identifying external factors that might encourage consumer's impulse buying. Previous research examining the effect of external marketing cue factors such as price reduction on impulse buying has focused on reminder impulse buying, which is more rationally motivated and utilitarian than pure impulse buying (Abratt & Goodey, 1990; Liao *et al*., 2009; Stern, 1962). Previous findings indicate that price reduction should not only be strong enough to encourage consumer's pure impulse buying, there should be additional stimuli to generate pure impulse buying. This research revealed that a price discount promotion combined with a product scarcity buying condition increased impulse buying. Developing in-store promotions that induce the perception of product scarcity may play an important role in encouraging in-store impulse buying. Therefore, this study makes a contribution on identifying factors encouraging impulse buying.

Finally, this study revealed that consumer's buying impulse at a state level is associated with impulse buying. Past research has focused on the relationship between individual's innate impulsivity (impulse buying tendency) and impulse buying (Beatty & Ferrell, 1998; Sharma *et al*, 2010; Youn & Faber, 2000). However, our study revealed that an individual's state level of impulsivity can be increased by external factors such as a scarcity promotion, and state level of impulsivity also induces impulse buying. In other words, people can be manipulated to be more impulsive than usual.

Marketing Implications

This study may provide insights for retailers in understanding ways to induce consumer's impulsivity by using scarcity strategies. Specifically, our findings will be helpful for retailers to establish effective marketing stimuli that may encourage consumer's impulsive spending.

The present study revealed a main effect for product scarcity on buying impulse and impulse buying decision. In case of in-store promotion, retailers may increase consumer's impulse purchases by controlling the presentation of product quantity restrictions to the consumer. In addition to presenting a POP signage indicating limited supply of product, using a sales person who can indicate product quantity or using an in-store announcement indicating limited supply of product would be helpful to induce shopper's perception of scarcity.

The present study failed to reveal an effect of decision time scarcity on buying impulse and impulse buying decision. If retailers need to choose one scarcity tactic between decision time scarcity and product scarcity, implementing product scarcity tactic would be more helpful to increase impulse buying. However, we found that decision time scarcity affects perceived arousal and perceived arousal is directly related to buying impulse response. In addition, the combination of decision time and product scarcity significantly increased perceived arousal. Therefore, decision time scarcity might not be a direct influence, but it may also increase impulse buying. For example, when retailers have some unsold units to sell out, presenting a clearance promotion under limited time offer with emphasizing limited availability may increase consumer's perceived arousal and further increase impulse purchases.

We revealed that perceived competition influences buying impulse. Also, the findings of this study discovered that perceived competition influenced perceived arousal, which in turn influences buying impulse. Therefore, another practical implication derives from the observation

that framing buying conditions as being competitive might increase consumer's impulse. To generate competitive buying conditions among the buyers, implementing product scarcity tactic will increase perceived competition between buyers. In addition, introducing product deals when the shopping environment is relatively crowded would be effective because buyers might perceive other buyers as potential competitors.

The present study revealed a relationship between perceived arousal and buying impulse. Consumers who are emotionally aroused by a certain stimulus in the shopping environment are likely to make an impulsive purchase decision. As Mehrabian and Russell (1974) suggested, perceived arousal is an important mediating variable between environmental stimuli and impulse buying behavior. Thus, to increase consumer's perceived arousal during the shopping trip, it is important for the retailers to provide a pleasurable and fun shopping environment and draw attention from the shoppers. In other words, retailers should create immersive and hedonic shopping environment such as providing attractive product displays to attract consumers. For example, presenting a vivid poster that highlights the remaining product quantity might spur emotional stimulation (Zhou & Wong, 2003). As another example, Macy's has an "impulse section" which provides trendy lines or hot designer collaboration to capture consumer attention. Also, fully utilizing in-store announcements to introduce product deals to draw attention from the consumers is suggested.

Finally, using scarcity tactics to increase impulse buying might depend on product type. In the pretest, neither decision time nor product scarcities were effective to induce impulse purchases for tablet PC. Perhaps scarcity tactics are not effective in overcoming the economic burden of high priced product. The effect of a scarcity tactic on impulse buying might not be applicable to a high price product. Perhaps product type should be low range priced. At the same

time, the product should be attractive to the consumers to stimulate consumer's impulse. For example, it might be profitable to apply scarcity tactics to fashion goods such as clothing or accessories, which are in reasonable price range and could enable one's self-expression, and increase consumer's impulsive purchase.

Limitations and Future Research

Although the findings of this study have potential implications for academic researchers and marketing practitioners, several limitations exist.

This study conducted an experiment by using hypothetical scenarios, so it might not represent real shopping conditions. Scarcity conditions assigned to the respondents in this experiment may not be perceived as realistic and that may reduce the external validity of the experiment. In addition, this study did not measure consumer's actual purchase. There might be a difference between impulse buying decision and true purchase probability. If the study were conducted in retail settings, it would increase the external validity and further assess the effectiveness of the scarcity conditions.

This study has limited generalizability. This study used Mechanical Turk workers as a sample, who are familiar with the internet market place, so gender distribution was skewed to male respondents. With more equivalent gender participation, the study would be more representative. In addition, participants were more educated with higher unemployment compared to the general population. Therefore, there is limitation in representing a general population. In addition, this study tested only one product type (i.e., wine), so the extent to which these findings are applicable might be limited. The effect of scarcity may vary by different product categories, so it would be interesting to compare the difference in effect of scarcity on impulse buying between various product categories such as high vs. low priced products, self-

expressive products vs. non-self-expressive products, or hedonic vs. utilitarian products.

It would be interesting to see if there is difference if we used a higher level of price reduction. Because price is one of the most important decision criteria that consumers consider for purchase, the results of scarcity effects on impulse buying might be different in a higher level of price reduction. While this study set a price reduction level as 25%, greater than 75% price discount such as clearance sale might create a more arousing shopping environment. It is also possible that time scarcity in a shopping environment with high discounts or in a clearance sale might excite people and there would be an effect of time limitation on impulse buying.

In addition, future studies should use different retail formats (e.g. online shopping context) and different product categories. This study only investigated the effect of scarcity on impulse buying in an in-store, warehouse context. Because it is suggested that online shoppers are more impulsive than others (Donthu & Garcia, 1999), it would be interesting to see whether there is any difference in effect of scarcity on impulse buying in online shopping context.

Additional research should examine the effect of proximity of the product on impulse buying. It would be interesting to investigate the difference in effect of scarcity on impulse buying between consumers who are introduced to a promotion via in-store announcement and consumers encountering a promotion at the point-of-purchase. Because physical proximity is an important factor that increases impulse buying (Beatty & Ferrell, 1997; Hoch & Loewenstein, 1991), consumers close to the product when presented with a sense of urgency appeal might make greater impulse purchases compared to those who are far from the product deal.

APPENDIX

APPENDIX

Consent form

CONSENT FORM

Title of the Study: Consumer Shopping Behavior

You are invited to be in a research study on consumer shopping behavior. We ask that you read this form and ask any questions you may have before agreeing to be in the study.

Purpose of research: The purpose of this study is to understand consumer's shopping decisions while in a retail store. Based on your responses, this research will help us extend our knowledge of consumer's shopping behavior. Please note that in order to be eligible to participate in this study, you need to be older than 18 years old.

What you will do: You will be asked to read a scenario, and you will be asked to answer questions in a short survey.

Privacy and confidentiality: The data for this project are being collected anonymously. All responses will be kept strictly confidential and reported together with those of other participants so that no individual will be identified in any way. Your privacy will be protected to the maximum extent as allowable by law. Data will be analyzed only in the aggregate so that your name will not be associated with the answers you provide.

Your rights to participate, say no, or withdraw: Participation is completely voluntary. You have the right to say no. Therefore, you may choose not to participate and may discontinue participation at any time. Moreover, you can withdraw or refuse to answer any particular question.

Benefits and Risks of Being in the Study: Once you complete the survey questions, you will earn $0.5. The whole experiment will take approximately 10 minutes to complete. You are not expected to participate in any treatments that would incur the risk of physical or mental injury during your participation in this study.

Contact and Questions:
If you have any questions about this study such as scientific issues, or how to do any part of it, please contact the researchers: Dr. Patricia Huddleston (517-353-9907, huddles2@msu.edu, 309 Communication Arts and Science, Michigan State University, East Lansing, MI 48824) or Jung Yun Kim (814-574-4453, kimjun36@msu.edu).

If you have questions or concerns regarding your rights as a study participant, or are dissatisfied at any time with any aspect of this study, you may contact anonymously if you wish, the Michigan State University's Human Research Protection Programs at 517-355-2180, Fax 517- 432-4503, or email irb@msu.edu or regular mail at 207 Olds Hall, East Lansing, MI 48824.

Statement of Consent:
I voluntarily agree to participate in this study by clicking below.

- ○ Yes
- ○ No

Scenario

Figure 5 Image of Shopping Environment

I went to Costco to do my weekly shopping.

I had shampoo, tissue, light bulbs, eggs, milk, cereal, bread, yogurt, salad dressing, and pasta sauce on my shopping list.

I walked around the store and put the products on my list into my shopping cart.

On the way to the checkout after I found everything on my list, I hear the following in-store announcement:

Treatments

Figure 6 Treatment 1: 5 Min./ 20 Bottles

Attention Costco shoppers!

The one of top 10 wine brands, "Robert Mondavi" is now on promotion in the liquor department.

Its original price was $26.70. Now, it is $19.99 with 25% price off.

This offer is available for 5 minutes, and supplies are limited to 20 bottles.

Don't miss this special offer!

Figure 7 Image of Robert Mondavi

Robert Mondavi

-Price Was: $26.70

Now: $19.99

-Pinot Noir 2011

-from Carneros ,California

Figure 8 Treatment 2: 5 Min./ 200 Bottles

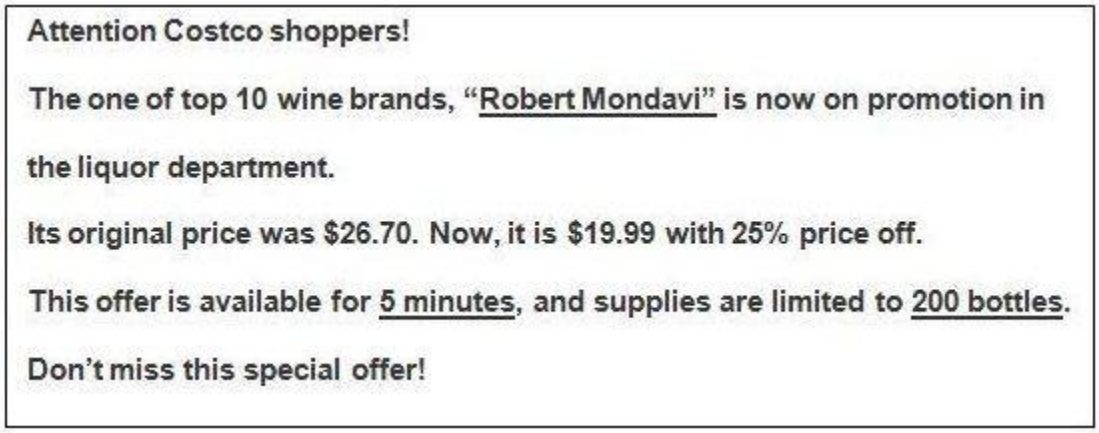


Figure 9 Treatment 3: 1 Hr/ 20 Bottles

Figure 10 Treatment 4: 1 Hr/ 200 Bottles

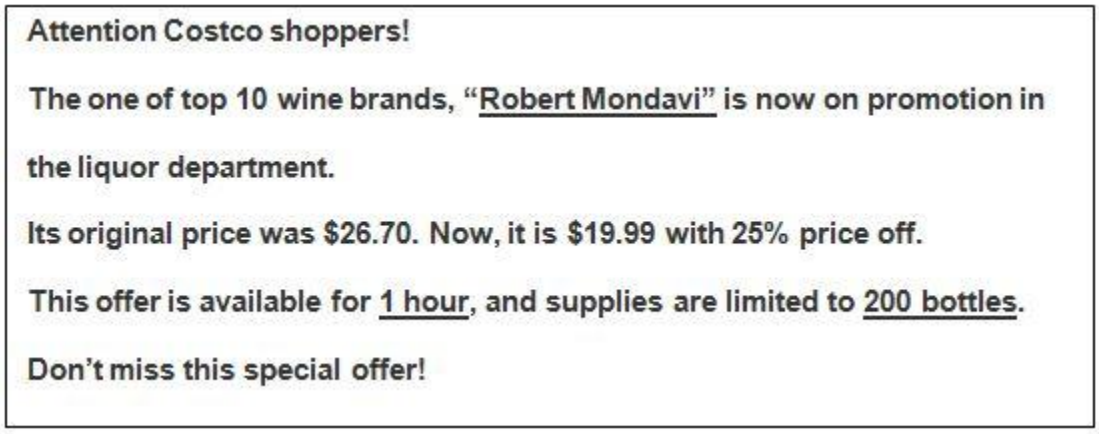


Figure 11 Treatment 5: 5 Min./ No Product Scarcity

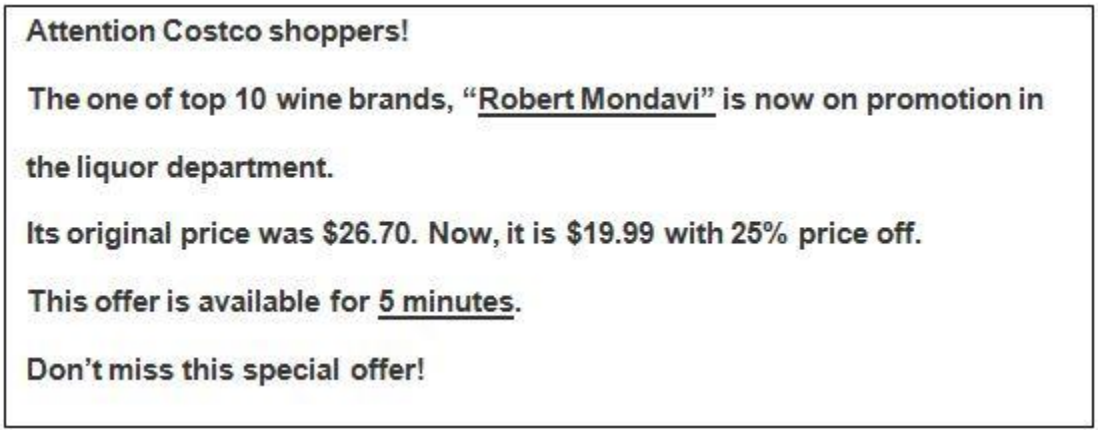


Figure 12 Treatment 6: 1 Hr/ No Product Scarcity

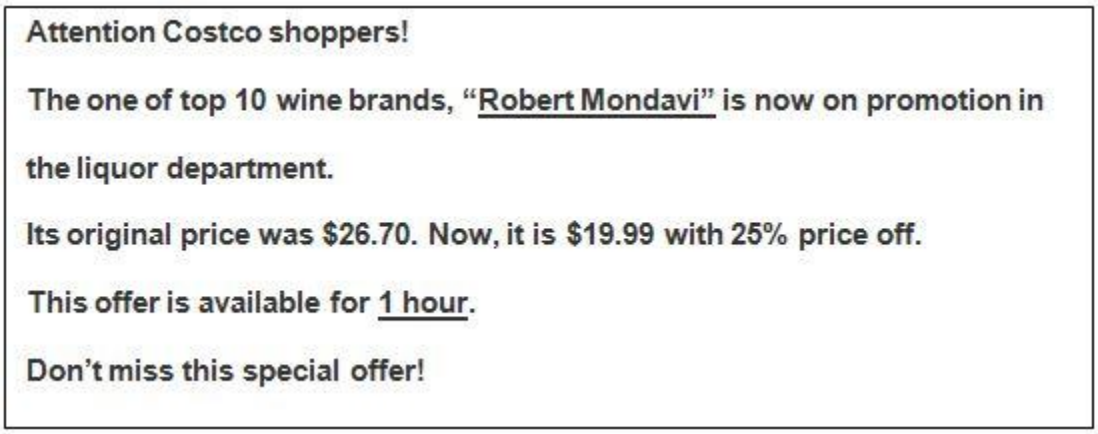
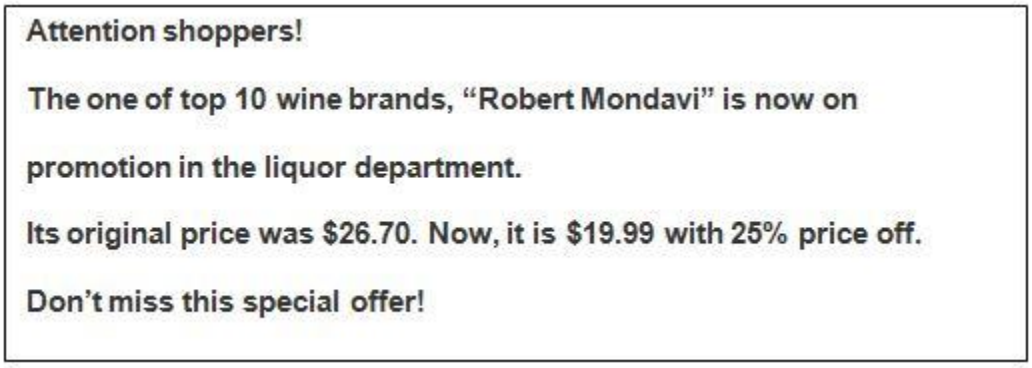


Figure 13 Treatment 7: No Decision Time Scarcity/ 20 Bottles

Figure 14 Treatment 8: No Decision Time Scarcity/ 200 Bottles

Figure 15 Treatment 9: No Decision Time Scarcity/ No Product Scarcity



Questionnaire

Please indicate how you feel at this moment **by checking the appropriate choice.**.

	Does not describe how I feel at all	Very slightly describes how I feel	A little describes how I feel	Moderately describes how I feel	quite a bit describes how I feel	Accurately describes how I feel	Describes exactly how I feel
Active	○	○	○	○	○	○	○
Depressed	○	○	○	○	○	○	○
Drowsy	○	○	○	○	○	○	○
Dull	○	○	○	○	○	○	○
Energetic	○	○	○	○	○	○	○
Excited	○	○	○	○	○	○	○
Exhausted	○	○	○	○	○	○	○
Forceful	○	○	○	○	○	○	○
Lively	○	○	○	○	○	○	○
Sharp	○	○	○	○	○	○	○
Sluggish	○	○	○	○	○	○	○
Tired	○	○	○	○	○	○	○
Vigorous	○	○	○	○	○	○	○
Weak	○	○	○	○	○	○	○
Weary	○	○	○	○	○	○	○
Alert	○	○	○	○	○	○	○
Aroused	○	○	○	○	○	○	○
Fatigued	○	○	○	○	○	○	○
Inactive	○	○	○	○	○	○	○
Powerful	○	○	○	○	○	○	○
Quiet	○	○	○	○	○	○	○
Sleepy	○	○	○	○	○	○	○
Slow	○	○	○	○	○	○	○
Worn-out	○	○	○	○	○	○	○

Please indicate how you feel at this moment **by checking the appropriate choice.**

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I think I might lose the opportunity to purchase the product if others bought it first	○	○	○	○	○	○	○
I feel there is a lot of competition from other buyers to purchase this product	○	○	○	○	○	○	○
In order to get this deal, I think I have to make the purchase before others do	○	○	○	○	○	○	○

Please indicate how you feel at this moment **by checking the appropriate choice.**

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
I experienced a sudden urge to buy this product	○	○	○	○	○	○	○
I want to buy this product even though it was not on my shopping list.	○	○	○	○	○	○	○
I experienced no strong urge to make an unplanned purchase on this shopping trip	○	○	○	○	○	○	○
On this shopping trip, I felt a sudden urge to buy this product	○	○	○	○	○	○	○

Please indicate how you feel at this moment by checking the appropriate choice.

	Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
It is probable that I would buy this wine.	○	○	○	○	○	○	○
It is likely that I would buy this wine.	○	○	○	○	○	○	○
It is possible that I would buy this wine	○	○	○	○	○	○	○

Will you purchase this wine?

○ Yes

○ No

Please indicate your thoughts by checking the appropriate choice.

	Very Scarce	Scarce	Somewhat Scarce	Neither Scarce or Abundant	Somewhat abundant	Abundant	Very Abundant
The time allowed for this wine promotion (5 minutes) was..	○	○	○	○	○	○	○
The quantity of wine available (20 bottles) was..	○	○	○	○	○	○	○

Do you currently have bottles of wine?

- ○ Yes (if yes, how many bottles of wine do you have?)
- ○ No

Do you have a plan to buy a bottle of wine in the next 6 months?

- ○ Yes
- ○ No

What is your age?

Gender

- ○ Male
- ○ Female

Marital Status

- ○ Never Married
- ○ Married
- ○ Divorced
- ○ Separated
- ○ Others

Number of Children

- ○ No children
- ○ 1
- ○ 2
- ○ more than 3 children

Which one of the following best describes your ethnic background?

- ○ American Indian and Alaska Native
- ○ Asian
- ○ Black or African American
- ○ Caucasian/White
- ○ Hispanic
- ○ Native Hawaiian and other Pacific Islander
- ○ Some other race (Please specify)
- ○ Two or more races
- ○ Rather not say

What is the highest level of education completed?

- ○ Some High School
- ○ High School
- ○ Some College
- ○ College Degree
- ○ Graduate Degree
- ○ Don't want to answer

Employment Status

- ○ Not employed
- ○ Self-employed
- ○ Works for someone else, part time
- ○ Works for someone else, full time
- ○ Full time student

Household Income

- ○ $20,000 or less
- ○ $20,001 - $39,999
- ○ $40,000 - $59,999
- ○ $60,000 -$79,999
- ○ $80,000 -$99,999
- ○ $100,000 -$119,999
- ○ $120,000 or more
- ○ I do not know
- ○ I prefer not to answer

Provide your Worker ID here (for verification, e.g. A1ABCDEF1234EFG)

End of the survey. Don't forget to click the next button.

BIBLIOGRAPHY

BIBLIOGRAPHY

AARP, (2010), "To Buy or Not To Buy: Shopping Behavior in a Recession Economy. A Survey of Washington Residents 18+", (April)

Abratt, R. & Goodey, S. D. (1990), "Unplanned Buying and In-store Stimuli in Supermarkets," *Managerial and Decision Economics*, 11, 111–21.

Adelaar. T, Chang, S., Lancendorfer, K. M., Lee, B., & Morimoto, M. (2003), "Effects of Media Formats on Emotions and Impulse Buying Intent," *Journal of Information Technology*, 18 (December), 247-66.

Aggarwal, P. & Vaidyanathan, R. (2003), "Use It or Lose It: Purchase acceleration Effects of Time-Limited Promotions," *Journal of Consumer Behavior*, 2 (4), 393-403.

_____, Jun, S. Y., & Huh, J. H. (2011), "Scarcity Message: A Consumer Competition Perspective," *Journal of Advertising*, 40 (3), 19-30.

Aguirre-Rodriguez, A. (2013), "The Effect of Consumer Persuasion Knowledge on Scarcity Appeal Persuasiveness," *Journal of Advertising*, 42 (4), 371-9.

Albright, M. (2007), "Kmart's Blue Light Back on," tampabay.com, available at: http://www.sptimes.com/2007/05/16/Business/Kmart_s_blue_light_ba.shtml

Alford, B. L. & Biswas, A.(2002), "The Effects of Discount Level, Price Consciousness and Sale Proneness on Consumers' Price Perception and Behavioral Intention," *Journal of Business Research*, 55,775-83.

Anderson, C. A., Deuser, W. E., & DeNeve, K. M. (1995), "Hot Temperatures, Hostile Affect, Hostile Cognition, and Arousal: Tests of a General Model of Affective Aggression," *Personality and Social Psychology Bulletin*, 21 (5), 434-48.

Anderson, J.C. & Gerbing, D.W.(1988), "Structural Equation Modeling in Practice: A Review and Recommended Two-Step Approach," *Psychological Bulletin*, 103, 411-23.

Bae, Y. & Lee, S. (2005), "The Effect of Scarcity Message on Consumer's Purchase Intention in the Internet Shopping Mall," *Asia Pacific Advances in Consumer Research*, 6, 252-8.

Beatty, S. E. & Ferrell, M. E. (1998), "Impulse Buying: Modeling Its Precursors," *Journal of Retailing*, 74 (2), 169–91.

Bellenger, D. N., Robertson, D. H., & Hirschman, E. C. (1978), "Impulse Buying Varies by Product," *Journal of Advertising Research*, 18(6), 15-8.

Bentler, P. M. & Bonett, D. G. (1980), "Significance Tests and Goodness of Fit in the Analysis of Covariance Structures," *Psychological Bulletin*, 88 (3), 588-606.

Berinsky, A. J., Huber, G. A. & Lenz, G. S. (2012), "Evaluating Online Labor Markets for Experimental Research: Amazon.com's Mechanical Turk," *Political Analysis, available at: http://pan.oxfordjournals.org/content/early/2012/03/02/pan.mpr057.abstract*

Bessarabova, E., Fink, E. L. & Turner, M. (2013), "Reactance, Restoration, and Cognitive Structure: Comparative Statics," *Human Communication Research*, 39, 339-64.

Brehm, J. W. (1966), *A Theory of Psychological Reactance*, New York: Academic Press, Inc.

_____, Stires, L. K., Sensenig, J. & Shaban, J. (1966), "The Attractiveness of an Eliminated Choice Alternative," *Journal of Personality and Social Psychology*, 2, 301-13.

Brock, T. C. (1968),"Implications of Commodity Theory for Various Change," in *Psychological Foundations of Attitudes*, Greenwald, A. G., Brock, T. C., & Ostrom, T. M., eds., New York: Academic Press, 243-75.

Bureau of Labor Statistics, (2012), Current Population Survey, October 5, 2012.available at: http://www.census.gov/hhes/socdemo/education/data/cps/2013/tables.html

Business Trends (2010), "New Frugality May Be an Enduring Feature of Post-recession Economy," February. 25.

Byun, S. E. & Sternquist, B. (2008), "The Antecedents of In-store Hoarding: Measurement and Application in the Fast Fashion Retail Environment," *The International Review of Retail, Distribution, and Consumer Research*, 18 (2), 133-47.

_____&_____ (2011), "Fast Fashion and In-store Hoarding: The Drivers, Moderator, and Consequences," *Clothing and Textiles Research Journal, 29 (3)*, 187-201.

_____&_____ (2012), "Here Today, Gone Tomorrow: Consumer Reactions to Perceived Limited Availability," *The Journal of Marketing Theory and Practice*, 20 (2), 223-34.

Cheng, A. S. K. & Lee, H. C. (2012), "Risk-taking Behavior and Response Inhibition of Commuter Motorcyclists with Different Levels of Impulsivity," *Transport Research Part F*, 15, 535-43.

Chung, S. & Hernstein, R. J. (1967), "Choice and Delay of Reinforcement," *Journal of Experimental analysis of Behavior*, 10 (1), 67-74.

Cialdini, R. B. (1985), *Influence: Science and Practice* (1st edition), Scott, Foresman and Company.

_____ (1993), *Influence: The Psychology of Persuasion*, New York: William and Morrow company, Inc.

_____ (2008), *Influence: Science and Practice* (5th edition), Boston: Pearson Education.

Clee, M. A. & Wicklund, R. A. (1980), "Consumer Behavior and Psychological Reactance," *Journal of Consumer Research*, 6 (March), 389-405.

Cobb, C. J. and Hoyer, W. D. (1986), "Planned Versus Impulse Purchase Behavior," *Journal of Retailing*, 62 (4), 384-409.

Costco Investor Profile, available at: http://phx.corporate-ir.net/phoenix.zhtml?c=83830&p=irol-homeprofile

Dawson, S. & Kim, M. (2009), "External and Internal Trigger Cues of Impulse Buying Online," *Direct Marketing: An International Journal*, 3 (1), 20-34.

Dhar, R. & Nowlis, S. M. (1999), "The Effect of Time Pressure on Consumer Choice Deferral," *Journal of Consumer Research*, 25 (March), 369-84.

Dholakia, U. M. (2000), "Temptation and Resistance: An Integrated Model of Consumption Impulse Formation and Enactment," *Psychology and Marketing*, 17 (11), 955–82.

Dittmar, H., Beattie, J., & Friese, S. (1995), "Gender identity and material symbols: Objects and decision considerations in impulse purchase," *ActaPsychologica*, 16, 495-511.

_____& Druary, J. (1999), "Self-image-Is It in the Bag?", A Qualitative Comparison between "Ordinary" and "Excessive Consumers," *Journal of Economic Psychology*, 21, 109-142.

Dolliver, M. (2009), "Impulse Buying is Alive and Well", Nielsen Business Media, Nov.20

Donovan, R. J. & Rositter, J. R. (1982), "Store Atmosphere: An Environmental Psychology Approach," *Journal of Retailing*, 58 (1), 34-57.

Donthu, N.& Garcia, A.(1999), "The Internet Shopper," *Journal of Advertising Research*, 39 (3), 52-8.

Eisend, M. (2008), "Explaining the Impact of Scarcity Appeals in Advertising," *Journal of Advertising*, 37 (3), 33-40.

Engel, J. & Blackwell, R. (1982), *Consumer Behavior*, Chicago: Dryden Press

Fahy, T. & Eisler, J. (1993), "Impulsivity and Eating Disorders," *British Journal of Psychiatry*, 162, 193-7.

Fedorikhin, A. & Patrick, V. M. (2010), "Positive Mood and Resistance to Temptation: The Interfering Influence of Elevated Arousal," *Journal of Consumer Research*, 37 (4), 698-711.

Freedman, J. L. & Edwards, D.R. (1988), "Time Pressure, Task Performance, and Enjoyment," In J. McGrath (Ed.), *The Social Psychology of Time: New Perspectives*, 91, 113-33. Newbury Park, CA: Sage.

Gierl, H., Plantsch, M., & Schweidler, J. (2008), "Scarcity Effects on Sales Volumes in Retail",

The International Review of Retail, Distribution, and Consumer Research, 18 (1), 45-61.

_____ & Huettl, V. (2010), "Are Scarce Products Always More Attractive? The Interaction of Different Types of Scarcity Signals with Products' Suitability for Conspicuous Consumption," *International Journal of Research in Marketing*, 27, 225-35.

Grewal, D. & Sharma, A. (1991),"The Effect of Salesforce Behavior on Customer Satisfaction: An Interactive Framework," *Journal of Personal Selling & Sales Management*, 11 (3), 13-23.

_____, Marmorstein, H. & Sharma, A. (1996), "Communicating Price Information through Semantic Cues: The Moderating Effects of Situation and Discount Price," *Journal of Consumer Research*, 23 (2), 148-55.

Gupta, S. (2013), "The Psychological Effects of Perceived Scarcity on Consumers' Buying Behavior,"(Doctoral Dissertation), Available from ProQuest Dissertations & Thesis database. (UMI No. 3589761)

Hair, J., Black, W., Babin, B. & Anderson, R. (2010), *Multivariate data analysis* (7th ed.): Prentice-Hall, Inc. Upper Saddle River, NJ, USA.

Hammock, T. & Brehm, J. W. (1966), "The Attractiveness of Choice Alternatives When Freedom to Choose is Eliminated by a Social Agent," *Journal of Personality*, 34, 546-54.

Han, Y. K., Morgan, G. A., Kotsiopulos, A. & Kang-Park, J. (1991), "Impulse Buying Behavior of Apparel Purchasers," *Clothing and Textiles Research Journal*, 9(3), 15-21.

Hardesty, D. M. & Bearden, W. O. (2003), "Consumer Evaluations of Different Promotion Types and Price Presentations: The Moderating Role of Promotional Benefit Level," *Journal of Retailing*, 79, 17-25.

Hausman, A. (2000) "A multi-method Investigation of Consumer Motivations in Impulse Buying Behavior," *Journal of Consumer Marketing*, 17 (5), 403–19.

Hayes, S. G. & Jones, N. (2006), "Fast Fashion: A Financial Snapshot", *Journal of Fashion Marketing and Management*, 10 (3), 282-300.

Hoch, S. J. & Loewenstein, G. F. (1991), "Time-inconsistent Preferences and Consumer Self-control," *Journal of Consumer Research*, 17 (March), 492-507.

Inman, J. J., Peter, A. C. & Raghubir, P. (1997), "Framing the Deal: The Role of Restrictions in Accentuating Deal Value", *Journal of Consumer Research*, 24, 68-79.

Iyer, E. S. (1989), "Unplanned Purchasing: Knowledge of Shopping Environment and Time Pressure", *Journal of Retailing*, 65(1), 40-57.

Jarboe, G. R. & McDaniel, C. D. (1987), "A Profile of Browsers in Regional Shopping Malls", *Journal of the Academy of Marketing Science*, 15 (1), 46-53.

Jeffrey, S.A. & Hodge, R. (2007), "Factors influencing impulse buying during an online purchase," *Electronic Commerce Research*, 7, 367-79.

Jones, M. A., Reyolds, K. E., Weun, S., & Beatty, S. E. (2003), "The Product-specific Nature of Impulse Buying Tendency," *Journal of Business Research*, 56, 505-11.

_____., Taylor, V. A. & Reynolds, K. E. (2014), "The Effect of Requests for Positive Evaluations on Consumer Satisfaction Ratings," *Psychology & Marketing*, 31 (3), 161-70.

Kline, R. B. (1998), *Principles and Practice of Structural Equation Modeling*, New York: Guilford.

Kollat, D. T. & Willett, R. P. (1967), "Customer Impulse Purchasing Behavior," *Journal of Marketing Research*, 4 (1), 21-31.

_____&_____ (1969), "Is Impulse Purchasing Really a Useful Concept for Marketing Decisions?," *Journal of Marketing*, 33 (1), 79–83.

Ku, H., Kuo, C. &Kuo, T. (2012), "The Effect of Scarcity on the Purchase Intentions of Prevention and Promotion Motivated Consumers", *Psychology and Marketing*, 29 (8), 541-8.

Laran, J. (2010), "Choosing Your Future: Temporal Distance and the Balance between Self-control and Indulgence", *Journal of Consumer Research*, 36 (April), 1002-15.

LaRose, R. (2001), "On the Negative Effects of E-commerce: A Socio-cognitive Exploration of Unregulated On-line Buying", *Journal of Computer Mediated Communication* (Online), 16, Available at: www.ascusc.org/jcmc/vol6/issue3/larose.html.

Lee, H. W., Choi, J., Shin, Y., Lee, J., Jung, H. Y. & Kwon, J. S. (2012), "Impulsivity in Internet Addiction," *Cyberpsychology, Behavior and Social Networking*, 15 (7), 373-7.

Lessne, G. J. (1987), "The Impact of Advertised Sale Duration on Consumer Perceptions," In J. M. Hawes (Ed.) *Developments in Marketing Science*, Vol. 10, Atlanta: Academy of Marketing Science, 115-7.

Li, H. (1995), "*The Influence of Scarcity Messages on Impulse Buying: an Experimental Studies of TV Home Shopping Programs*," (Doctoral Dissertation), Available from ProQuest Dissertations & Thesis database. (UMI No. 9537237)

Liao, S., Shen, Y., & Chu, C. (2009), "The Effects of Sales Promotion Strategy, Product Appeal and Consumer Traits on Reminder Impulse Buying Behavior," *International Journal of Consumer Studies*, 33, 274-84.

Luo, X. (2005), "How Does Shopping with Others Influence Impulsive Purchasing?," *Journal of Consumer Psychology*, 15 (4), 288-94.

Lynn, M. (1989), "Scarcity Effects of Desirability: Mediated by Assumed Expensiveness?,"

Journal of Economic Psychology, 10, 257-74.

_____ (1991), "Scarcity Effects on Value: A Quantitative Review of the Commodity Theory Literature," *Psychology and Marketing*, 8 (1), 43-57.

_____ (1992), "The Psychology of Unavailability: Explaining Scarcity and Cost Effects on Value," *Basic and Applied Social Psychology*, 13 (1), 3-7.

_____ (1992), "Scarcity's Enhancement of Desirability: The Role of Naïve Economic Theories," *Basic and Applied Social Psychology*, 13 (1), 67-78.

MacKenzie, S. B., Lutz, R. J. & Belch, G. E. (1986), "The Role of Attitude Toward the Ad as a Mediator of Advertising Effectiveness: A Test of Competing Explanations," *Journal of Marketing Research*, 23 (May), 130-43.

Mazis, M. B., Settle, R. B., & Leslie, D. C. (1973), "Elimination of Phosphate Detergents and Psychological Reactance," *Journal of Marketing Research*, 10, 390-5.

Mehrabian, A. & Russell, J. A. (1974), *An Approach to Environmental Psychology*, MIT Press, Cambridge, MA

Mitchell, A. (1998), "Time Is New Currency in Quick-fire Economy," *Marketing Week*, 20 (45), 42-3.

Nguyen, T. T. M., Jung, K., Lantz, G., & Loeb, S. G. (2003), "An Exploratory Investigation into Impulse Buying Behavior in a Transitional Economy: A Study of Urban Consumers in Vietnam", *Journal of International Marketing*, 11 (2), 13-35.

Nunally, J. C. (1978), "*Psychometric theory*", New York: McGrow-Hill.

O'Guinn, T. C. & Faber, R. J. (1989), "Compulsive Buying: A Phenomenological Exploration", *Journal of Consumer Research*, 16 (September), 147-57.

Parboteeah, D. V., Valacich, J. S. & Wells, J. D. (2009), "The Influence of Website Characteristics on a Consumer's Urge to Buy Impulsively", *Information Systems Research*, 20 (1), 60-78.

Park, J. H. & Lennon, S. J. (2004), "Television Apparel Shopping: Impulse Buying and Parasocial Interaction", *Clothing and Textile Research Journal*, 22 (3), 135-44.

_____ & _____ (2006), "Psychological and Environmental Antecedents of Impulse Buying Tendency in the Multichannel Shopping Context," *Journal of Consumer Marketing*, 23 (2), 58-68.

Park, W., Iyer, E. S., & Smith, D. C. (1989), "The Effect of Situational Factors on In-store Grocery Shopping Behavior: The Role of Store Environment and Time Available for Shopping", *Journal of Consumer Research*, 15 (4), 422-33.

Parker, J. R. & Lehmann, D. R. (2011), "When l-based Scarcity Impacts Consumer Preferences," *Journal of Retailing*, 87 (2), 142-55.

Piron, F. (1991), "Defining Impulse Purchasing", *Advances in Consumer Research*, 18, 509-14.

Read, D., Loewenstein, G., & Kalyanaraman, S. (1999), "Mixing Virtue and Vice: Combining the Immediacy Effect and the Diversification Heuristic", *Journal of Behavioral Decision-making*, 12 (December), 257-73.

Rodriguez-Jimenez, R., Avila, C., Jimenez-Arriero, M. A., Ponce, G., Monasor, R., Jimenez, M., Aragues, M., Hoenicka, J., Rubio, G. & Palomo, T. (2006), "Impulsivity and Sustained Attention in Pathological Gamblers: Influence of Childhood ADHD History", *Journal of Gambling Studies*, 22, 451-61.

Rook, D. W. (1987), "The Buying Impulse," *Journal of Consumer Research*, 14 (September), 189–99.

_____& Gardner, M. P. (1993), "In the Mood: Impulse Buyings' Affective Antecedents", *Research in Consumer Behavior*, 6, 1-28.

_____& Fisher, R.J. (1995), "Normative Influences on Impulsive Buying Behavior", *Journal of Consumer Research*, 22, 305–13.

Ross, J., Jaldivar, A., Irani, L. Tomlinson, B., & Silberman, M.S. (2010), "Who Are the Crowdworkers? Shifting Demographics in Mechanical Turk," *CHI 2010*, April, 2863-72.

Rummel, A., Howard, J., Swinton, J. M. & Seymour, D. B. (2000), "You Can't Have That: A Study of Reactance Effects & Children's Consumer Behavior, *Journal of Marketing Theory and Practice*, 8 (1), 38-45.

Sanbonmatsu, D. M. & Kardes, F. R. (1988), "The Effects of Psychological Arousal on Information Processing and Persuasion," *Journal of Consumer Research*, 15 (Dec), 379-85.

Scherr, J., Ferraro, F. R. & Weatherly, J. N. (2010), "Associations between Impulsivity and Body Dissatisfaction in Females at Risk for Developing Eating Disorders", *Current Psychology*, 29, 297-306.

Schindler, R. M. (1998), "Consequences of Perceiving Oneself as Responsible for Obtaining a Discount," *Journal of Consumer Psychology*, 7 (4), 371-92.

Sharma, P., Sivakumaran, B. & Marshall, R. (2010), "Impulse Buying and Variety Seeking: A Trait-correlates Perspective," *Journal of Business Research*, 63 (3), 276-83.

Sherman, R. C., End, C., Kraan, E., Cole, A., Campbell, J., Birchmeier, Z. & Klausner, J. (2000), "The Internet Gender Gap among College Students: Forgotten but Not Gone?," *CyberPsychology & Behavior*, 3 (5), 885-94.

Simmons, J. P., Nelson, L. D., & Simonsohn, U. (2011), "False-Positive Psychology: Undisclosed Flexibility in Data Collection and Analysis Allows Presenting Anything as Significant," *Psychological Science*, 22 (11), 1359 -66.

Spears, N. (2001), "Time Pressure and Information in Sales Promotion Strategy: Conceptual Framework and Content Analysis," *Journal of Advertising*, 30 (1), 67-76.

Stern, H. (1962), "The Significance of Impulse Buying Today," *Journal of Marketing*, (April), 59–62.

Suri, R., Kohli, & Monroe, K. B.(2007), "The Effects of Perceived Scarcity on Consumers' Processing of Price Information," *Journal of the Academy of Marketing Science*, 35 (1), 89-100.

_____& Monroe, K. B. (2003), "The Effects of Time Constraints on Consumers' Judgments of Price and Products," *Journal of Consumer Research*, 30 (June), 92-104.

The Drink Business. Com (2013), "Top 10 Wine Brands", Nov. 8th, 2012, available at: http://www.thedrinksbusiness.com/2012/11/top-10-wine-brands-2012/8/

U.S. Census Bureau, (2013), Current Population Survey: Annual Social and Economic Supplement. available at: www.census.gov/newsroom/cspan/employment/

Verhallen, T. M. M. (1982), "Scarcity and Consumer Choice Behavior," *Journal of Economic Psychology*, 2, 299-322.

Verplanken, B. & Herabadi, A. (2001), "Individual Differences in Impulse Buying Tendency: Feeling and No Thinking," *European Journal of Personality*, 15 (S1), 71-83.

Vohs, K. D. & Faber, R. J. (2007), "Spent Resources: Self-Regulatory Resource Availability Affects Impulse Buying," *Journal of Consumer Research*, 33 (March), .537-47.

Wansink, B. (1994), "The Dark Side of Consumer Behavior: Empirical Examinations of Impulsive and Compulsive Consumption," *Advances in Consumer Research*, 21, 508.

Wingrove, J. & Bond, A. J. (1997), "Impulsivity: A State as well as Trait Variable. Does Mood Awareness Explain Low Correlations between Trait and Behavioral Measure of Impulsivity?," *Personality and Individual Differences*, 22 (3), 333-9.

Wu, W., Lu, H., Wu, Y., & Fu, C. (2012), "The Effects of Product Scarcity and Consumer's Need for Uniqueness on Purchase Intention," *International Journal of Consumer Studies*, 36, 263-74.

Youn, S. & Faber, R. J. (2000), "Impulse Buying: Its Relation to Personality Traits and Cues," *Advance in Consumer Research*, 27, 179–85.

Zhou, L. & Wong, A. (2003), "Consumer Impulse Buying and In-store Stimuli in Chinese Supermarkets," *Journal of International Consumer Marketing*, 16 (2), 37–53.