CONSUMERS' PSYCHOLOGICAL RESPONSE TO SEQUENTIAL MARKETING COMMUNICATIONS: PERCEPTIONS, INFORMATION PROCESSING, AND BEHAVIORS.

by

DONG-JUN MIN

(Under the Direction of MARCUS V. M. DA CUNHA JR.)

ABSTRACT

Marketers often attempt to persuade consumers to purchase their brands by frequently reaching out to consumers through promotional and communication efforts. As these practices have increased, so has the importance of consumers' ability to make inferences and evaluate the appropriateness of persuasion attempts, as this is directly related to the probability of making an optimal decision. My dissertation aims to extend extant knowledge about the cognitive processes involving sequential marketing communications by investigating how the structure of repeated persuasive attempts systematically influences consumer's perceptions, processing of information, attitudes and behavior. With this goal in mind, my dissertation identifies three factors that influence the cognitive processes that precede consumer judgment and decision making: (1) the amount of alterations within a sequence of recurring marketing communications, (2) the order in which marketing information is presented, and (3) the amount of perceived risk in the context of consumer choice. Overall, my dissertation contributes to the literature in consumer information processing by shedding light onto novel factors that may affect consumers' psychological responses to sequential marketing communications and product information, and provide

marketers with the knowledge needed to ensure that consumer's reaction to marketing communications are in line with the marketer's intentions.

INDEX WORDS: Sequential Marketing Communications, Judged Randomness, Timing of Advertisement Repetition, Value Trade-offs and Risk

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DEDICATION

This dissertation is dedicated to my parents, Bonhong Min and Soonbok Jo, who have always loved me unconditionally and whose good examples have taught me to work hard for the things that I aspire to achieve. My sister, Sungju Min, have been one of my best cheerleaders and I thank you for being there for me throughout the years.

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CHAPTER 1

INTRODUCTION AND LITERATURE REVIEW

Marketers often attempt to persuade consumers to purchase their brands by frequently reaching out to consumers through promotional and communication efforts. As these practices have increased, so has the importance of consumers' ability to make inferences and evaluate the appropriateness of persuasion attempts, as this is directly related to the probability of making an optimal decision. To better understand how consumers respond to such persuasive efforts by marketers, consumer researchers have long been interested in uncovering how consumers interpret and make predictions based on previous data (e.g., promotions, advertisements, word-of-mouth) or experiences (Bobinski, Cox, and Cox 1996; Brown and Krishna 2004; Campbell and Kirmani 2000; Friestad and Wright 1994; Hardesty, Beardon, and Carlson 2007; Kachersky and Kim 2011; Willams, Fitzsimons, and Block 2004). Although extant literature has investigated how and when persuasion affects consumers' beliefs and attitudes, there is limited research on how the sequence of recurring persuasion interactions can influence consumers' psychological responses. This is an important factor that needs to be considered as future predictions made from prior knowledge are affected not only by the interpretation of each individual event but also by the sequential structure of such events.

My dissertation aims to extend extant knowledge about the cognitive processes involving sequential marketing communications by investigating how the structure of repeated persuasive attempts systematically influences consumer's perceptions, processing of information, attitudes and behavior. In Chapter 2, I examine how the alterations within a sequence of recurring

marketing communications lead consumers to make inferences regarding customization. As a central part of cognition that has been known to have important implications, prior research on people's ability to distinguish between patterns and randomness (e.g., randomness cognition; Olivia and Oppenheimer 2008) has persisted for quite some time, as a key feature of human judgment is the ability to make predictions based on the meanings derived from what we see and experience. In particular, it has been found that a key determinant of how people judge the subjective randomness or likely source of a given sequence of outcomes is the rate of how often the sequence switches from one to another (i.e., alteration rate; Ayton and Fischer 2004). Based on the literatures examining people's judgment of randomness, I propose and find that firms may benefit from communicating with their consumers using a sequence that is perceived more likely as randomly generated (i.e., high alteration rate) because such a sequence increases consumers' perceptions of their unique status with the marketer, leading consumers to infer that the firm has a focus on customer orientation. As a result, consumers are more likely to purchase from companies that use high alteration rates in their persuasion attempts.

In Chapter 3, I investigate how the order in which marketing information is presented influences consumers' processing and recall of relevant product information. Prior research in this stream of literature has often reported that spaced presentations (i.e., presentations interspaced by time or other stimuli) leads to superior learning and recall of repeated information than massed presentation (i.e., presentations in succession). Despite the robustness of the spacing effect (Janiszewski et al. 2003) the vast majority of research supporting the advantage of spaced presentations has focused on studying spacing effects from a time interval perspective without consideration of intervals created by other stimuli. This is an important issue from a marketing standpoint as it is highly unlikely that consumers will encounter advertisements in absence of

additional competing persuasive attempts. Thus, it remains to be answered under what conditions massed or spaced presentation involving interspacing of advertisements will enhance recall of brand information. Drawing upon research in information processing strategies (Craik and Lockhart 1972) and selective attention (Gentner 1983), I develop a theoretical framework to describe how massed (i.e., presentations in succession) and spaced presentation (i.e., presentations interspaced by other stimuli) induces different types of information processing strategies, leading consumers to more selectively process repeated information. Conceptually, I propose that consumers are more likely to learn new information by making connections between new and old information based on differences (similarities) when repetitions are spaced (massed), resulting in enhanced recall for nonalignable (alignable) attribute information.

Evoked by the findings in Chapter 3 that identifies a unique relationship between different types of product attribute information and consumer learning, Chapter 4 further examines how consumers may utilize different types of product attribute information to make purchase decisions under risk. Given that the standard assumption in the literature of decision making under risk implies that risk is negatively associated with the attractiveness of an option (March and Shapira 1987; Weber, Anderson, and Birnbaum 1992), one way an individual can reduce perceived risk is by focusing on information that increases the precision of estimates regarding the quality of each product's objective value relative to all other available options (Conchar et al. 2004; Erdem and Swait 2004; Peterson and Merino 2003; Taylor 1974). Based on this line of reasoning, it is plausible to expect that decision making under risk is more likely to be based on information that provides an objective ranking-based standard for product evaluation rather than on information that does not allow for an objective product evaluation. Drawing upon research on ambiguity aversion (Ellsberg 1961; Heath and Tversky 1991; Klein, Cerully, and

Monin 2010), I propose an alternative account of how one would go about making a choice when facing risk, and show that consumers' favorable perceptions of their own competence may lead consumers facing higher levels of risk to more positively value an attribute that reflects their own preference but does not allow for an objective product evaluation (i.e., horizontal product attribute) than an attribute that unambiguously indicates product performance and provides a clear ranking-based standard for product evaluation (i.e., vertical product attribute).

Overall, my dissertation contributes to the literatures in consumer information processing by shedding light into novel factors that may affect consumers' psychological response to sequential marketing communications and product information, and provide marketers with the knowledge needed to ensure that consumer's reaction to marketing communications are in line with the marketer's intentions.

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CHAPTER 2

THE EFFECT OF PERCEIVED RANDOMNESS OF PERSUASION ATTEMPTS ON CONSUMER PREFERENCE[1]

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Abstract

Although consumer behavior research has identified many factors that influence the way in which consumers interpret, evaluate, and respond to persuasion attempts from marketers, there is limited research on how the sequence of recurring persuasion interactions can affect consumers' responses to such persuasion attempts. In this research, I propose that consumers can also be persuaded by the structure of the sequence of persuasion attempts, beyond the content and number of exposures to persuasion attempts. Across five experiments, I find that firms may benefit from communicating with their consumers using a sequence with frequent alterations of the promotional content because this type of sequential structure is perceived to be more likely randomly generated, signaling a focus on customer orientation via perceptions of uniqueness. Given that the simple act of observing a sequence of marketing communications may not be perceived by consumers as an attempt by the firm to direct behavior, consumers' reactance to persuasion attempts may be lessened and they may be more likely to behave as intended by marketers.

Introduction

Marketers often attempt to persuade consumers to purchase their brands by frequently targeting consumers using promotional and communication efforts. To illustrate, the amount of dollars circulated in the form of free standing insert coupons (FSI) grew by 11.2% from 2012 to 2013, amounting to $467 billion dollars (287 billion coupons) redeemable in 2013, according to Kantar Media's report (2014). A similar trend can be observed in digital marketing: Experian Marketing Services (2014) reported a year-over-year growth of 11.2% in the volume of promotional emails in the fourth quarter of 2013 relative to the same quarter in 2012. Such persuasive efforts are not going unnoticed by consumers, given that nearly one in three emails sent in North America were opened in the first quarter of 2013, compared to that of the same quarter of 2011where only one in five emails were opened. With the growth of both volume and channels of persuasion attempts, it is crucial for marketers to understand what kind of inferences consumers make from such efforts.

Although it should come as no surprise that marketers allocate large portions of their budgets in an attempt to persuade consumers to buy their brands, the decision about the sequence in which the consumers receive promotional offers may vary substantially across marketers. For instance, imagine the case of two retailers that decide to offer either a 15% discount coupon or free shipping to a group of consumers during a six-week promotional period. Imagine also that one of the retailers decides to send weekly email offers of a 15% discount during the first three weeks followed by promotional emails offering free shipping during the remaining three weeks, whereas the other retailer decided to alternate between the two promotions every week during the six weeks periods. Would these varying patterns of sequences influence consumers' attitudes

toward these retailers and consequently influence their choice? For instance, would consumers perceive a retailer that uses a sequence of emails that changes the type of promotion weekly as a retailer attempting to learn which types of promotions that trigger a purchase behavior or as a retailer attempting to customize a set of offers to the needs of that consumer? The answer to the question depends on whether the structure of the sequence of promotional materials itself has persuasive powers over consumers.

Consumer researchers have long been interested in uncovering how consumers interpret and make predictions based on previous data (e.g., promotions, advertisements, word-of-mouth) or experiences. In their seminal paper on the Persuasion Knowledge Model (PKM), Friestad and Wright (1994) introduced the idea of consumers using prior knowledge to interpret, evaluate, and respond to persuasion attempts from marketers, which often leads to consumer reactance to persuasion attempts. Accordingly, prior research has examined this phenomenon across a wide array of marketing contexts, including consumer reactions to different pricing tactics (Bobinski, Cox, and Cox 1996; Brown and Krishna 2004; Hardesty, Beardon, and Carlson 2007; Kachersky and Kim 2011), covert marketing activities (e.g., product placement; Wei, Fischer, and Main 2008), interpersonal marketing agents (e.g., salespeople and service personal; Kirmani and Campbell 2004), and activation of cultural cues (Brumbaugh 2002). Research has also been conducted on identifying factors that activate the use of persuasion knowledge, such as the accessibility of persuasion motives and cognitive capacity of the consumer (Campbell and Kirmani 2000; Willams, Fitzsimons, and Block 2004).

Whereas the extant literature on persuasion has investigated how and when persuasion attempts affect consumers' beliefs and attitudes, no study to the best of my knowledge has

investigated how the pattern of recurring persuasion attempts influences consumers' perceived intentionality of the marketing agent. This important factor needs to be considered, as future predictions can be affected not only by the interpretation of each individual event, but also by the sequential structure of such events (Higgins and King 1981; Oskarsson et al. 2009). To illustrate, the decision to sell a stock may depend not only on the current performance of the market, but also on the pattern of oscillation across a certain period.

In the current research, I aim to shed light on how the pattern of a sequence of persuasive attempts systematically influences how consumers' interpret marketers' intent and the ensuing effect on consumer attitude and choice. Specifically, I focus on understanding the inferences consumers make about the alteration rate of marketing promotions when overall promotional content and number of exposures are kept constant. Based on the literature examining people's judgment of randomness (e.g., Olivia and Oppenheimer 2008), I propose that firms may benefit from communicating with their consumers using a sequence of promotions that is more likely to be perceived as randomly generated because such sequence signals to consumers that the marketing agent tailors promotions to its consumers' preferences (i.e., most consumers received a unique patterns of promotional emails). This, in turn, leads consumers to infer that the firm has a customer/relational orientation. Conversely, a sequence of promotions that is perceived to be less likely randomly generated signals to consumers that the marketing agent does not tailor promotions to its consumers preferences (i.e., most consumers received the same patterns of promotional emails), leading consumers to infer that the firm lacks customer/relational orientation. The downstream implication stemming from these inferences is that consumers prefer to buy from firms that use sequences that signal greater randomness. This shift in preference is found to be robust to varying methods of sequence presentations, consumer-firm

relationships, and product categories. The results also showed that the type of consumption involved (e.g., habitual versus loyal consumption) moderates the perceived randomness effect, which further corroborates the predicted underlying mechanism. In the process of testing these predictions, I contribute to the literature on judged randomness by extending the findings to non-binary alternatives and by proposing novel predictions for situations in which the agent generating process is kept constant.

Conceptual Development

Judging Sequences of Events: Alteration Rate and Perceived Randomness

Throughout their lifetime, individuals often encounter sequences of repeated events, such as oscillations in the stock market, performance of their favorite sports team across seasons, and the promotional emails sent from retailers to consumers who opt-in to their mailing list. The importance of sequence judgments has been noted in the psychology literature (Falk and Konold 1997; Kwan et al. 2012; Oskarsson et al. 2009), as it influences one's ability to make predictions based on previous data or experiences by affecting the perceived relationship between the individual events and the structure of sequences. A well-known example in this literature is the gambler's fallacy (Ayton, Hunt, and Wright 1989; Kahneman and Tversky 1972; Lopes and Oden 1987), which describes a systematic bias where long runs of the same outcome (e.g., five heads from the toss of a coin), regardless of their actual randomness (e.g., 50% chance), are not perceived as a good representation of the expected output of a random chance and need to be balanced by the opposite outcome (e.g., next outcome is more likely tails). Overall, an important argument that stems from this literature is that the ability to distinguish between patterns and

randomness plays an important role in influencing predictions based on a series of events and that people's intuitive judgment of subjective randomness (e.g., even distribution) systematically deviates from stochastic randomness (e.g., non-deterministic distribution).

Among the many factors that determine judgments of randomness, the alteration rate (AR), which is a measure of the number of alterations relative to the maximum number of possible alterations in a sequence, has been a variable of interest in the psychology literature (Ayton and Fischer 2004; Falk and Konold 1997; Lopes and Oden 1987; Matthews 2013; Nickerson 2002). To illustrate AR, take a sequence of binary alternatives (i.e., possible outcomes being either @ or #) featuring 11 events. In such a sequence, there is a maximum of 10 instances wherein the next outcome differs from the previous outcome. If 10 alterations occurred in a sequence (e.g., @#@#@#@#@#@), the AR is 1 because 10 alterations occurred out of the 10 alterations possible (10/10). If 2 alterations occurred in a sequence (e.g., @@@###@@@@@@), the AR is 0.2 because 2 alterations occurred out of the 10 alterations possible (2/10).

When the sequences of events are truly random, the expected value of the AR should be 0.5. However, prior research has consistently found that people judge sequences with alteration rates greater than 0.5 to be more random compared to sequences with alteration rates lower than 0.5. In particular, Ayton and Fischer (2004) found that a steady increase in the AR from 0.2 to 0.8 results in an increase in perceived randomness, which in turn influences causal beliefs (i.e., the greater the AR, the greater the likelihood that a sequence is perceived as produced by a random mechanical process).

Implications of Perceived Randomness: Inferences about Customer Orientation

As mentioned above, the ability to judge a sequence of events includes both perceptual (i.e., perceived randomness) and conceptual (i.e., causal attributions) components. In other words, whereas people rely on the AR to distinguish random from non-random sequence of events, such perceived randomness is subsequently used to make certain inferences about the characteristics of the agents generating these sequences (Matthews 2013; Oskarsson et al. 2009). One interesting finding from prior research on causal attributions is that people tend to perceive acts of mechanical devices (versus human) to be more random (versus systematic). For example, when participants were asked whether they thought a given sequence was generated by a random mechanical process (e.g., coin tosses, roulette wheels) or a skilled human action (e.g., basketball shooting, tennis serves), they tended to classify sequences with AR equal or greater than 0.5 as being generated by a random mechanical process rather than by a skilled human (Ayton and Fischer 2004; Falk and Konold 1997; Lopes and Oden 1987). However, it is important to note that whereas prior research has found that perceived randomness is associated with different types of mechanisms that could potentially generate the sequence, no study to the best of my knowledge held the agent constant and examined the inferences people make about the agent's intent under different levels of perceived randomness. This important factor needs to be considered within a marketing communications context because in this context a single source (e.g., a retailer or manufacturer) makes decisions about the sequence of persuasion attempts. Thus, this research examines the contribution of one potentially important factor, i.e., the perceived intent of the agent generating the sequence.

To further explore this issue, it is important to understand how individuals interpret randomness. Falk and Konold (1997) found that when people attempt to make sense of the randomness of a sequence, they do so by addressing the size of the set of similar sequences produced (e.g., length of streaks within a given sequence) rather than using some form of probabilistic index based on a mathematical computation (e.g., calculating the AR). This argument is supported by research examining the role of redundancy in explaining subjective judgments of patterns. Redundancy is defined as the degree of intercorrelation between information presented in the decision task (Gilliland and Schmitt 1993), and can be evidenced by regularities and/or duplications of the values on display (Gardner 1970). This line of research finds randomness to be perceived as inversely related to redundancy, suggesting that relatively smaller number of sequences have similar patterns to one another when a set of sequences is produced randomly (Garner 1970). Consequently, sequences featuring longer (shorter) streaks of the same series of events are perceived to be less (more) random and more (less) redundant. Since low-AR sequences, relative to high-AR sequences, naturally feature a smaller number of alterations and consequently longer streaks, they should be perceived as more redundant.

To illustrate the implications of the argument above in a marketing context, imagine a consumer who has opted-in to receive promotional emails from a number of retailers. For the sake of simplicity, assume that retailers send out to their consumers only three different types of promotions (A = 20% off, B = free delivery, and C = free premium) once a week for 21 weeks. In this sequence of 21 emails, the promotion could possibly change from one email to the next in 20 instances (i.e., every week after the first week). If the AR is 0.3 (6/20), one possible sequence of promotions could look like ‘AAACCCCCAAABBBCCBBBBA’, whereas a sequence of 0.7 AR (14/20) could look like ‘ACCABCBBABCCCBACABBAA’. In both cases, the number of

each type of promotion that a consumer would receive from each retailer is exactly the same. The only meaningful difference across the sequences is the order in which the retailers send the promotions in the 21-week period, resulting in sequences with varying levels of AR.

Based on the findings from prior research, a low-AR promotional sequence (e.g., sending out reminders of the standing offer for a large number of weeks and then changing the offer for subsequent weeks), should be perceived as less random; hence, the consumer is likely to infer high redundancy in the pattern of emails. Such perceived redundancy could create a spillover effect, leading the consumer to believe that a large portion of consumers received the same promotions, signaling a lack of customization. If that is the case, I argue that low-alteration rates lead consumers to make an inference that the retailer lacks customer/relational orientation because the relationship between the firm and their customers is seen as more standardized and impersonal (Coviello, Brodie, and Munro 1997). Alternatively, a high-AR sequence (e.g., type of promotions varying frequently rather than simply reminding consumers of the standing offer) should increase perceived randomness and consequently decrease perceived redundancy, leading consumers to believe that only a small portion of consumers received the same promotions. If that were the case, I argue that high-alteration rates would lead consumers to infer that the retailer has a customer/relational orientation and that the relationship between the firm and its customers is more customized and personal (Saxe and Weitz 1982). I thus hypothesize:

H1: A sequence of marketing promotions featuring high (low) AR should be perceived as more randomly (systematically) generated and therefore perceived as less (more) redundant. Consequently, high- (low-) AR promotional sequences should signal greater (lesser) focus on customer/relational orientation.

Given the vast amount of prior research that reported a positive influence of customer orientation on firm performance (e.g., Stock and Hoyer 2005; Williams and Attaway 1996) and my prediction of more (less) favorable evaluations of firms using high- (low-) AR promotional sequences, I further hypothesize:

H2: Consumers will prefer to purchase from firms that use high-AR promotional sequences to firms that use low-AR promotional sequences.

I tested the predictions above in three main experiments and two supplemental experiments. In experiment 1, I found that firms might benefit from communicating with their consumers using a high-AR promotional email sequence, as this sequence is perceived by the consumers to be randomly generated and less redundant, signaling a focus on customer orientation. In experiment 2, I ruled out alternative explanations based on perceptions of promotion variety by showing that the findings were not influenced by how often the customer makes a purchase. In experiment 3, I provided further evidence that corroborates the proposed underlying mechanism by showing that perceived randomness has the predicted effect only for consumption situations that call for greater need of customization. Mediation analysis supported the mechanism underlying the predicted effect in all the experiments.

Experiment 1

Experiment 1 was designed to investigate the proposed link between perceived randomness and customer orientation (H1) and provide initial support for the prediction regarding the effect of AR on consumer evaluations of the firm (H2). To conduct this test, I presented participants with sequences of promotional emails featuring varying levels of AR from

two competing pet supply retailers. I then asked them to select one of the retailers as their retailer of choice and evaluate the retailers on a series of measures. As hypothesized, if perceptions of randomness change as a function of changes in the AR level, one should observe a larger proportion of participants to perceive the retailer that uses high-AR promotional sequences as more customer oriented compared to the retailer that uses low-AR sequences. As a result, the retailer that uses a high-AR promotional sequence should be more positively evaluated compared to the retailer that uses a low-AR sequence, and participants should prefer to purchase from the high-AR retailer rather than from the low-AR retailer.

Pilot Study

To test whether the promotional sequences developed for the experiment indeed triggered perceptions of randomness and redundancy, I asked 133 participants (average age = 31; 36% female) recruited from Amazon's Mechanical Turk (MTurk) to judge the extent to which sequences with varying AR levels were randomly generated (procedure adapted from Matthews 2013). Judgments of randomness were measured on 9-point scales for the following questions: "Please rate the randomness of the sequence (1 - Not at all random, 9 - Completely random)," "Please indicate how random you perceive the sequence to be (1 - Not at all random, 9 - Completely random)," "Do you think this sequence was produced by a random process or a non-random process? (1 - Definitely random process, 9 - Definitely non-random process)," and "According to your intuition, how likely do you think the sequence was generated by a random process (1 - Least likely, 9 - Most likely)." Participants were shown three sequences in randomized order in which the outcomes were represented by symbols (e.g., @ @ @ $ & % # #

& & & # # $ % % % % $ $ @). Participants were asked to rate three different sequences one at a time (order randomized). Two of the sequences were developed for the main experiment (0.3AR and 0.7AR) and one additional sequence was a filler sequence to create a standard against which the two sequences of interest could be evaluated (0.5AR; sequences presented in the appendix).

Following these ratings, participants were asked to imagine that each of the sequences they saw previously represented a series of promotional emails that were sent out by three pet supply retailers to Mr. Smith (scenario used in main experiment). Participants were told that each symbol within the sequences represented a certain promotion that was included in the emails (e.g., @ = $15 OFF Pet Health Product, $ = Save 20% Off Dental Solutions, & = Up To 25% Off Grooming Supplies). Participants were then told that they would see the sequence of the emails that a customer received from each retailer over the past few months in the order in which they were received. They were warned that the overall number of each type of promotion was the same across the three retailers and the only change was the sequence in which the different promotions were offered. Participants then reviewed and evaluated the three sequences of promotional offers from each retailer one at a time. Immediately following the presentation of each sequence of emails from the three retailers, participants were asked to rate the extent to which they agreed/disagreed with the statement “The large majority of customers of Retailer X received the exact same sequence of emails that Mr. Smith received” (measured on a 7-point scale ranging from 1 – Strongly disagree, to 7 – Strongly agree). This measure was used to test the extent to which perceptions of randomness influenced perceived redundancy.

For the measures of perceived randomness, I created a composite mean score variable based on a factor analysis, which showed that all items loaded on a single factor (eigenvalues

indicated that the first factor explained more than 85% of the variance) and a reliability analysis indicated high internal consistency (Cronbach's $\alpha > .90$). The same procedure employed to generate the composite variable was used whenever there were multiple items measuring a single construct and results are not reported hereinafter. The results of a repeated measures ANOVA showed that increases in AR levels led to increased perceived randomness ($F(2,131) = 75.78$, $p < .001$), with participants perceiving the 0.7-AR sequence to be more likely generated by a random process ($M_{0.7AR} = 5.51$) when compared to the 0.3-AR sequence ($M_{0.3AR} = 2.81$; $p < .001$). Similarly, the results of repeated measures ANOVA on perceived redundancy showed that an increase in the AR level from 0.3 to 0.7 decreased perceived redundancy. Participants were less likely to agree with the statement that the majority of the customers of that given retailer received the exact same sequence of emails in the high-AR condition ($M_{0.7AR} = 4.38$) than in the low-AR condition ($M_{0.3AR} = 5.32$; $F(2,131) = 14.74$, $p < .001$).

Overall, these results showed that participants' judgment of randomness is consistent with the idea that sequences featuring high- (low)- AR levels are perceived as being more (less) likely to be randomly generated and less (more) redundant in terms of the pattern of emails being sent out by the retailer.

Experiment 1A

Participants. Ninety participants (average age = 33; 43% female) were recruited from MTurk in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to a condition within the two levels of AR (high vs. low) by two levels of relationship length (long vs. short) mixed-subjects design. I manipulated AR, the within-subjects factor, by presenting participants with sequences of promotional emails from two retailers with varying levels of AR based on promotional offers currently used by major pet supply retailers (e.g., $15 OFF Pet Health Product, Save 20% Off Dental Solutions). The promotions used to create the sequence were the same for both retailers, and each sequence consisted of 21 promotional emails featuring five different types of promotions (sequences presented in the appendix). A fixed order to match either a high-AR (0.7) or a low-AR (0.3) sequence was created using a random number generator. The first and last promotions were kept constant across all AR conditions to prevent primacy or recency effects. Unlike the pilot test, where I used a sequence of symbols, in experiment 1A, participants saw a sequence of promotions. The relationship length factor, manipulated between-subjects, was added to control for any potential confounding effects stemming from participants inferring length of relationship with either retailer as a function of the AR manipulation. To show that the amount of time a customer has been in a relationship with the retailer does not affect the results, participants in the short-(long)relationship condition were told that the customer in the scenario had brought home a new pet not long ago (owned the pet for the past ten years). In both cases, participants were told the customer opted to receive emails from two competing retailers from the time they first owned the pet. A pretest using Mturk workers (N = 50; average age = 36; 42% female) confirmed that participants in the long-relationship condition perceived the customer in the scenario to be in a business relationship with the retailer for a longer period of time ($M_{\text{Long_Relationship}} = 5.96$) than did participants in the short-relationship condition ($M_{\text{Short_Relationship}} = 1.85$; $t(48) = 12.49$, $p < .001$), when asked to indicate how long they thought

the customer has been in a relationship with the retailers (for a short period of time/for a long period of time; measured on a 7-point scale).

The experiment began by informing participants about a scenario involving a customer who had opted-in to receive promotional emails from two competing pet-supply retailers. Participants were then told that they would see the content of the emails that the customer received from each retailer over the past few months in the sequence in which they were received. To avert numerosity biases, participants were informed that if they spent time counting the number of each type of promotional offer, they would notice that the number of each type of promotion was the same across the two retailers and that the only change across retailers was the sequence in which the promotions were offered. Participants then reviewed the sequence of promotional offers from each retailer with randomly assigned AR levels two times on separate screens, one full sequence at a time (random order of presentation) and completed a series of questions designed to capture the dependent variables and process measures. As the main dependent measure, participants were asked to indicate the retailer from which the customer in the scenario would purchase the next time he/she was in need for pet supplies. Following this choice, participants' attitude toward the retailers was measured using a three-item scale (Bad/Good, Negative/Positive, Unfavorable/Favorable; all measured on 9-point scales). Participants were also asked to indicate their overall evaluation of each of the retailers on a four-item scale (Unfavorable/Favorable, Bad/Good, Unappealing/Appealing, Undesirable/Desirable; all measured on 9-point scales)[2]. For the first process measure, I used the measure of perceived redundancy used in the pilot study to capture the extent to which the promotional sequences

[2] While the sets of items measuring attitude and evaluation are highly correlated, I have retained them as distinct measures to reflect the affective and cognitive aspects of consumer response.

induced a sense of redundancy. For the second process measure, customer orientation, participants were asked to indicate the extent to which they agreed with each of the statements describing the norms of the retailer in this scenario (four scale items adapted from Homburg, Wieseke, and Bornemann 2009; "The company has the customer's best interest in mind", "The company recommends products or services that are best suited for each customer", "The company tries to find out which kinds of products or services would be most helpful to customers", "The company tries to figure out what the customer's needs are"; all measured on 7-point scales). Participants were then debriefed and thanked for their participation.

Results. In support of H2, an analysis of choice proportions revealed a significant effect of the AR factor on the choice of retailer, with participants being more likely to choose the retailer that used a high-AR sequence of promotional emails (70.0%) rather than the retailer that used a low-AR sequence of promotional emails (30.0%; $z = 4.14$, $p < .001$), and these choice proportions did not vary as a function of the relationship-length factor ($\chi^2(1) = 0.05$, $p > .80$). The pattern of results was replicated for all other dependent measures (i.e., consumer attitude and firm evaluations) and they are reported in Table 2.1 for this and all the remaining experiments. To ensure that the results are not constrained only to situations in which consumer can contrast the two target AR promotional sequences, I ran a version of experiment 1A with the AR factor manipulated between-subjects (N = 121; average age = 35; 45% female). The results replicated those of the main experiment, with participants being more likely to choose the retailer that used a high-AR sequence (60.7%) rather than the retailer that used a low-AR sequence of promotional emails (40.0%; $z = 2.33$, $p = .02$). Participants also had a more favorable attitude toward the

retailer that used a high-AR sequence (M_{High_AR} = 6.74) rather than the retailer that used a low-AR sequence of emails (M_{Low_AR} = 5.92; $t(119) = 2.69$, $p < .01$), and they evaluated the retailer that used a high-AR sequence (M_{High_AR} = 6.83) more favorably compared to the retailer that used a low-AR sequence (M_{Low_AR} = 5.76; $t(119) = 3.50$, $p < .001$).

Mediational Analysis. To test the significance of the indirect effect of sequence AR on firm evaluations through perceived redundancy and customer orientation, I conducted a mediational analysis using bootstrapping methods (Preacher and Hayes 2004; Zhao, Lynch, and Chen 2010) based on Hayes's (2012) PROCESS macro. Given that the statistical evidence regarding the total indirect effect may be questionable in a multiple mediator model due to multicollinearity and competition among mediators (MacKinnon 2008; Hayes 2009), I followed the recommendation of Hayes (2013) and focused on interpreting specific indirect effects. Since participants rated perceived redundancy and customer orientation for both retailers, I computed the difference score for each of these variables across retailers and used these two scores as the measurement indices, as recommended by Judd, Kenny, and McClelland (2001) for mediational analyses that use within-subject measurements. Supporting the hypothesized underlying mechanism, the analysis of a two-stage mediator model revealed that participants perceived the high-AR sequence to be less redundant compared to the low-AR sequence (10,000 bootstrap samples, β = -2.04, SE = .40; bias-corrected bootstrap 95% confidence interval [CI] = -2.82 to -1.25). The high-AR sequence, in turn, was associated with a greater perception of the retailer having a focus on customer orientation (β = -.25, SE = .09; 95% CI = -.43 to -.06). The direct effect of AR on customer orientation was statistically significant (β = 1.61, SE = .39; 95% CI

= .83 to 2.39), which, along with the partially mediated effect through perceived redundancy, translated into a greater likelihood to purchase from the retailer that used a high-AR sequence (β = 1.51, SE = .39; 95% CI = .75 to 2.27; see Figure 2.1).

To show that the indirect effect between sequence AR and consumer choice does not depend on the relationship-length factor, I estimated the conditional process model (i.e., moderated mediation, mediated moderation) using bootstrap analysis via MPLUS (Muthén and Muthén 2010), given that PROCESS (Hayes 2012) does not have the capability to test conditional process models (i.e., moderated mediation, mediated moderation) with two serial mediators. Following Muller, Judd and Yzerbyt's (2005) analytical procedures for testing conditional process models, I found no significant interaction effect between the AR and the relationship-length factors on perceived redundancy (95% CI = -2.52 to .56) and on customer orientation (95% CI = -1.12 to .69). The results were replicated for the attitude and firm evaluation measures, and they are reported in Table 2.2 for experiment 1 and all remaining experiments.

To alleviate the reverse causality concern stemming from the fact that the mediators were measured after the dependent measure, I followed Judd and Kenny's (2010) recommendation and estimated the model twice for each mediator separately, once with the dependent measure as a mediator and once with the mediator as a dependent measure. The results of a two-stage mediator model with consumer choice as the second mediator and perceived redundancy as the dependent measure showed a non-significant effect of choice on perceived redundancy (95% CI = -.82 to .99). Additionally, when running a reversed model with customer orientation as the dependent measure, the effect of perceived redundancy on consumer choice became non-

significant (95% CI = -.09 to .01). Thus, reversed causality does not appear to be a significant issue, given that the results of the reversed model do not resemble those of the specified model. Similar results were found when estimating the model using either consumer attitude or firm evaluation as the mediator. The same reverse-causality analysis was conducted for all experiments and the results were replicated. Thus, they are not reported hereinafter.

Experiment 1B

In experiment 1A, I presented the entire sequence of emails at once to avert wear in and wear out effects from the repeated presentation of the same stimuli (which could be a concern in the low-AR condition). Thus, one potential concern in experiment 1A is that the proposed randomness effect may be restricted to situations in which the entire sequence is observed at once. To rule out this potential concern, I ran a version of experiment 1A (41 Mturk participants ; average age = 31; 51% female) that showed the promotional emails one at a time on the computer screen, decreasing the salience of the overall sequence structure.

Results. The results replicated those of experiment 1A with participants being more likely to choose the retailer that used a high-AR sequence of promotional emails (70.7%) rather than the retailer that used a low-AR sequence of promotional emails (29.3%; $z = 2.91$, $p < .01$), and these choice proportions did not vary as a function of the relationship-length factor ($\chi^2(1) = 0.77$, $p > .35$).

Mediational Analysis. The analysis of a two-stage mediator model revealed that the high-AR sequence was perceived to be less redundant compared to the low-AR sequence (β = -2.49, SE = .61; 95% CI = -3.72 to -1.26). The high-AR sequence was in turn associated with a greater perception of the retailer having a focus on customer orientation (β = -.33, SE = .15; 95% CI = -.64 to -.02). A direct effect of sequence AR on customer orientation was also statistically significant (β = 1.95, SE = .70; 95% CI = .55 to 3.36), which, along with the partially mediated effect through perceived redundancy, translated into a greater likelihood to purchase from the retailer that used a high-AR sequence (β = 2.12, SE = .82; 95% CI = .51 to 3.73). The results of a conditional process analysis showed no significant interaction effect between the AR and the relationship-length factors on perceived redundancy (95% CI = -3.06 to 2.71) and customer orientation (95% CI = -2.03 to 1.28).

Discussion

Experiments 1A and 1B provide evidence supporting the predicted effect of sequence AR on consumer purchase intentions and show that the results are robust to different presentation formats and experimental designs. They demonstrate that firms may benefit from targeting consumers using a sequence of persuasion attempts with a high AR, given that consumers perceive such a sequence to be randomly generated which in turn signals lower redundancy. Perceptions of lower redundancy then lead consumers to believe that the firm is customer oriented. This pattern of results emerged regardless of the length of the relationship between the customer and the retailer.

One potential shortcoming of the findings in experiments 1A and 1B is that participants may have perceived that the retailer that used a high-AR sequence provided a greater variety of promotions as a function of the greater number of alterations. To be specific, although I explicitly stated that the overall number of each type of promotion was the same across the two retailers, it is plausible that participants thought that the promotions could expire in the near future, leading them to focus on various short-term offers rather than on the entire sequence of offers. If that was the case, the high-AR sequence might have been perceived as providing greater levels of variety within shorter periods (e.g., week 1-week 5). This may have increased the likelihood that the consumer in the scenario could find a promotional offer that would serve the consumer's short term-needs. I addressed this issue in experiment 2.

Experiment 2

In experiment 2, I addressed the short-term perceived variety alternative explanation by manipulating repurchase frequency. If perceived short-term variety within the sequence indeed drives the results found in experiments 1A and 1B, participants who observe sequences of promotional emails in a product category for which purchases are frequent should more favorably evaluate the retailer that used a high-AR sequence. In other words, if the short-term variety explanation accounts for the results in experiments 1A and 1B, the effect should be magnified when purchases are expected to be more frequent.

Experiment 2A

Participants. One hundred and twenty-one participants (average age = 31; 40% female) were recruited from MTurk in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to a condition within the two levels of AR (high vs. low) by two levels of repurchase frequency (frequent vs. infrequent) mixed-subjects design, with repurchase frequency as the between-subjects factor. Relative to experiment 1A, the only significant change in the design was that, instead of relationship length, I manipulated the frequency in which the customer in the scenario was expected to purchase a product (i.e., repurchase frequency). Participants in the frequent condition were presented with a scenario that involved a customer who purchase pet supplies once every three weeks on average. Participants in the infrequent condition were presented with a scenario that involved a customer who purchase pet supplies once every three months on average. Following the dependent and process measures, participants indicated how often they thought the customer in the scenario purchases pet supplies as a manipulation check of repurchase frequency (Regularly/Irregularly; measured on a 7-point scale).

Results. Participants in the frequent-repurchase condition perceived the customer in the scenario to make purchases more regularly ($M_{\text{Frequent\_Repurchase}} = 2.61$) than those in the infrequent-repurchase condition ($M_{\text{Infrequent\_Repurchase}} = 3.66$; $t(102) = 3.79$, $p < .001$), indicating a successful manipulation of repurchase frequency. In support of H2, an analysis of choice proportions revealed a significant effect of the AR factor with participants being more likely to choose the

retailer that used a high-AR sequence of promotional emails (75.2%) rather than the retailer that used a low-AR sequence of promotional emails (24.8%; $z = 6.42$, $p < .001$). The choice proportions did not vary as a function of the repurchase-frequency factor ($\chi^2(1) = 0.03$, $p > .85$). This result rules out the potential alternative explanation based on perceptions of short-term variety.

Mediational Analysis. The analysis of a two-stage mediator model revealed that participants perceived the high-AR sequence to be less redundant compared to the low-AR sequence (β = -2.80, SE = .41; 95% CI = -3.60 to -2.00), which, in turn, led to enhanced perceptions of customer orientation (β = -.26, SE = .06; 95% CI = -.39 to -.14). The direct effect of AR on customer orientation was statistically significant (β = 1.50, SE = .33; 95% CI = .85 to 2.15), which, along with the partially mediated effect through perceived redundancy, translated into a greater likelihood to purchase from the retailer that used a high-AR sequence (β = 1.16, SE = .26; 95% CI = .69 to 1.67). The results of a conditional process analysis showed no significant interaction effect between the AR and the repurchase-frequency factors on perceived redundancy (95% CI = -1.47 to 1.72) and customer orientation (95% CI = -.73 to .90), showing evidence that the indirect effect of sequence AR on consumer choice is unlikely to be explained by the promotion-variety alternative account.

Experiment 2B

I further addressed the potential concern stemming from frequency of purchase using a more naturalistic manipulation of frequency of purchase. In experiment 2B (N = 104; average

age = 29; 44% female), participants in the frequent condition were presented with a scenario that involved a customer who purchased pet supplies regularly. Participants in the infrequent condition were presented with a scenario that involved a customer who purchased home improvement products as needed. The types of promotions in the infrequent condition were modified to match type of retailer (sequences presented in the appendix).

Results. Participants in the frequent-repurchase condition perceived the customer in the scenario to make purchases more regularly ($M_{\text{Frequent\_Repurchase}} = 2.67$) than those in the infrequent-repurchase condition ($M_{\text{Infrequent\_Repurchase}} = 3.95$; $t(102) = 4.68$, $p < .001$), indicating a successful manipulation of repurchase frequency. Replicating the results of experiment 2A, participants were more likely to choose the retailer that used a high-AR sequence of promotional emails (67.3%) rather than the retailer that used a low-AR sequence of promotional emails (32.7%; $z = 3.76$, $p < .001$). The choice proportions did not vary as a function of the repurchase-frequency factor ($\chi^2 (1) = 0.02$, $p > .85$).

Mediational Analysis. The analysis of a two-stage mediator model revealed that participants perceived the high-AR sequence to be less redundant compared to the low-AR sequence (β = -2.10, SE = .45; 95% CI = -2.99 to -1.21), which, in turn, led to enhanced perceptions of customer orientation (β = -.27, SE = .09; 95% CI = -.44 to -.10). The direct effect of AR on customer orientation (β = 2.04, SE = .42; 95% CI = 1.20 to 2.88), which, along with the partially mediated effect through perceived redundancy, translated into a greater likelihood to purchase from the retailer that used a high-AR sequence (β = .98, SE = .21; 95% CI = .57 to

1.39). The results of a conditional process analysis showed no significant interaction effect between the AR and the repurchase-frequency factors on perceived redundancy (95% CI = -1.24 to 2.33) and customer orientation (95% CI = -.61 to 1.59).

Discussion

Experiments 2A and 2B provide further support for the hypotheses while ruling out an alternative explanation based on perceived short-term promotion variety. The results also show that the perceived randomness effect is robust to different consumption contexts (pet supply and home improvement). Overall, the evidence from experiments 1A-2B supports the claims that firms may benefit from communicating with their consumers using high-alteration sequences.

Experiment 3

In experiment 3, I further examine the proposed underlying mechanism by demonstrating that consumers' favorable response to firms using high-AR sequences indeed stems from their inferences about a marketer's intent regarding customer orientation. To be specific, I manipulated the level of loyalty toward a certain brand of toothpaste that was occasionally on promotion at local grocery stores. If perceptions of customer orientation stemming from perceived randomness of promotional sequences drive the results observed thus far, consumer loyalty should moderate the effect of sequence AR on preference for the retailers. This is expected because consumers may perceive that firms with greater focus on customer orientation are more likely to accurately identify consumer preferences (Kohli and Jaworski 1990) and provide personalized solutions to their specific product needs (Gwinner et al. 2005). As a result,

loyal consumers, who would likely have a relational orientation and value customer orientation, should prefer retailers that use a high-AR promotional sequence to retailers that use a low-AR promotional sequence. This preference, however, should be attenuated for non-loyal customers, who would be more likely to have a transactional orientation and be less likely to value customer orientation.

Method

Participants. Three hundred participants (average age = 31; 41% female) were recruited from MTurk in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to a condition within the two levels of AR (high vs. low) by two levels of brand loyalty (high vs. low) mixed-subjects design, with brand loyalty as the between-subjects factor. I manipulated brand loyalty as a way to indicate the nature of the customer relationship (relational versus transactional). Based on a pretest using Mturk workers (N = 39; average age = 33; 54% female), I selected two fictional brand names of toothpaste ('ABLIXA' and 'PERIOE') for which participants' attitude toward the brand names did not statistically differ ($t(38) = .87$, $p > .35$). The procedure was similar to the previous experiments with a few key differences. First, I manipulated AR by presenting participants with sequences of emails from two grocery stores regarding the availability of promotional offers for two fictional brands of toothpaste (sequences presented in the appendix). Within each sequence, the outcomes were represented by letters, each indicating the availability of promotions for one of the two brands for a given week (A = the email

INCLUDED a coupon for ABLIXA toothpaste, P = the email INCLUDED a coupon for PERIOE toothpaste, N = the email DID NOT INCLUDE a coupon for either toothpaste). Second, each sequence (created based on a random number generated) consisted of 21 emails with three different types of outcomes featuring either a high AR (0.7) or a low AR (0.3). Third, I manipulated brand loyalty by informing participants about the repeated purchase behavior of the customer in the scenario. Participants in the high-loyalty condition were told that the customer in the scenario was a loyal buyer of 'ABLIXA' (target brand randomly assigned) who would rather wait for the store to be restocked if 'ABLIXA' was sold out than buy 'PERIOE' toothpaste. Participants in the low-loyalty condition were told that the customer in the scenario usually bought 'ABLIXA' out of habit but he would not mind buying "PERIOE' toothpaste if 'ABLIXA' was sold out. Following the dependent and process measures, participants indicated the extent to which the customer in the scenario was loyal to the brand 'ABLIXA' as a manipulation check for brand loyalty (Not at all loyal/Very loyal; measured on a 7-point scale).

Results

Participants in the high-loyalty condition perceived the customer in the scenario to be more loyal to the target brand ($M_{\text{High\_Loyalty}} = 6.19$) than did those in the low-loyalty condition ($M_{\text{Low\_Loyalty}} = 3.79$; $t(298) = 14.62$, $p < .001$), indicating a successful manipulation of brand loyalty. An analysis of the choice proportions revealed that the effect of AR on choice varied as a function of the loyalty factor (χ^2 (1) = 10.31, $p < .001$). In the high-loyal condition, participants were more likely to choose the grocery store that used a high-AR sequence of promotional emails (62.3%) rather than the grocery store that used a low-AR sequence of promotional emails

(37.7%; $z = 3.15$, $p < .01$), replicating the pattern of results found in the previous experiments. However, choice proportions for the stores in the low-loyal condition did not statistically significantly differ depending on whether the retailer used a high-AR sequence (43.8%) or a low-AR sequence (56.2%; $z = 1.51$, $p > .10$). In sum, brand loyal consumers preferred the store that used a high-AR to the store that used a low-AR promotional sequence whereas non-brand loyal consumers were indifferent between the store that used a high-AR and the store that used low-AR promotional sequence.

Mediational Analysis

Overall, the results of a conditional process analysis showed that perceived redundancy and customer orientation, in serial, mediate the moderated effect of sequence AR and brand loyalty on consumer choice. Following the procedure of Muller, Judd and Yzerbyt (2005), I estimated three models to assess the significance of the conditional process. First, a simple moderation model revealed a significant interaction effect of sequence AR and brand loyalty on consumer choice (β = .31, SE = .11; 95% CI = .10 to .53), establishing the first step for a conditional process model. As predicted, whereas participants in the high-loyalty condition were more likely to prefer the store that used a high-AR sequence of emails rather than the store that used a low-AR sequence of emails (β = .12, SE = .04; 95% CI = .04 to .20), such preference was attenuated for those in the low-loyalty condition (β = -.05, SE = .04; 95% CI = -.14 to .03). Second, when assessing the effect of brand loyalty on customer orientation, I found a significant interaction effect between sequence AR and brand loyalty on perceptions of customer orientation (β = -.80, SE = .35; 95% CI = -1.49 to -.14). As theorized, sequence AR had a significant effect

on perceptions of customer orientation only for participants in the high-loyalty conditions (β = -.47, SE = .22; 95% CI = -1.03 to -.15) and not for participants in the low-loyalty condition (β = .07, SE = .18; 95% CI = -.26 to .46). Finally, I estimated a model in which both the effects of the independent variable and mediator on the dependent variable are allowed to be moderated. The results showed a significant effect of customer orientation on consumer choice (β = -.12, SE = .02; 95% CI = -.16 to -.08), while the interaction effect between sequence AR and brand loyalty on consumer choice was reduced in magnitude (β = .22, SE = .10; 95% CI = .02 to .42) compared to the moderation effect of the first model (i.e., overall treatment effect), indicating the significance of a conditional process model. The results were replicated for the attitude and firm evaluation measures, and they are reported in Table 2.3.

General Discussion

Understanding how consumers respond to consistent and frequent persuasive efforts is an important area of research because it improves our understanding of the inferences consumers make about the persuasive attempts and the downstream effect of such inferences on purchase decisions. As acknowledged by research on judgment of sequences (Falk and Konold 1997; Kwan et al. 2012; Oskarsson et al. 2009), it is important not only to investigate how and when each discrete persuasion events influence consumers' beliefs and attitudes, but also to uncover the interpretations regarding the sequential structure of such events, as both are important pieces of information that drive future behavior. The current research adds to this stream of literature by examining how the structure of repeated persuasive attempts (i.e., alteration rate) systematically influences consumers' perceptions and interpretations of the marketers' intent to customize

marketing communications, beyond the content being communicated and the number of persuasion attempts.

The results show robust supporting evidence that firms may benefit from communicating with their consumers using a sequence with frequent alterations, as such a sequence is perceived as less redundant and consequently, as tailored to the consumer's preference. Across five experiments, I found that exposure to a sequence of marketing communications featuring higher rates of alterations lead consumers to infer that the firm generating such sequence focus on the consumers' needs to a greater extent, influencing consumer choice. The proposed mechanism, based on the inverse relationship between randomness and redundancy leading to greater perception of customer orientation, was supported both by mediational analyses in all experiments and by moderation in experiment 3. The findings provide evidence that this phenomenon is robust and reliable, as the effect was observed across different consumer outcomes (choice of retailer, attitude towards the firm, and firm evaluation), different methods of sequence presentations (all promotions presented in a single screen versus one at a time), experimental designs (between-subjects, within-subjects), and product categories (pet supply products, home improvement products, oral care products).

I believe that this work offers several important contributions to the literature. Applied to the stream of research on persuasion, these findings demonstrate that consumers can be persuaded by the structure of the sequence of persuasion attempts, beyond the actual content and number of repetitions. Throughout all the experiments, I consistently observed that the structure of repeated persuasive attempts systematically influences consumer's perception and interpretation of the marketer's intent regarding customer orientation. Because of this perception,

I observed that firms might benefit from communicating with their consumers using a sequence that is perceived as randomly generated, especially when the type of consumption favors personalization. Applied to the stream of research on judgments of randomness, I extend the findings of research examining the influence of alteration rates as a key determinant of randomness judgments of sequences involving binary alternatives. More specifically, I examined people's judgment about randomness based on the perceptual pattern of distribution involving multiple alternatives and found sufficient evidence that extends the applicability of the role of alterations rates into the context of marketing communications.

Although the results are consistent with the proposed perceived randomness effect, I believe that future research should test this proposition across different types of marketing actions. In this research, the overall content and number of exposures were maintained constant between the sequences of promotional emails in order to control for the unintended influence of content variation on sequential judgments. However, the type of promotion may influence the selection of alteration rates that firms use when communicating with their consumer. For companies that favor the development of promotions that are broader in their usage (e.g., 20% off in-store purchases), there might be a lesser need for personalized communication. As such, it would be interesting to further investigate the inferences that consumers make regarding repeated persuasion attempts under different sequence structures and types of content. For example, the degree of uniqueness of each event might be an important factor that influences consumer inference of sequential marketing communication. When there is less overlap between the alternating promotions (e.g., 20% off outdoor cookware → $15 off Silicon Spatulas), we may see results similar to those presented in current research, as the salience of alterations are enhanced. However, the influence of alterations may be mitigated when consumers observe a sequence of

promotions that are more difficult to discern (e.g., 20% off in-store purchases → 20% off online purchases), as the perceptual difference induced by between varying levels of AR is diminished. In such a case, the decrease in perception of promotion uniqueness may lead to results that differ from those found in this research, which may be more pronounced if other perceptual cues surrounding the promotion are further involved (e.g., background color, letter font, or text location).

Tables

Table 2.1
Means and Standard Deviations for Consumer Attitude and Firm Evaluations

		High AR	Low AR
Experiment 1A[1]	Attitude	5.46 (2.18)[c]	4.44 (2.27)[c]
	Evaluation	5.49 (2.14)[c]	4.42 (2.29)[c]
Experiment 1B[1]	Attitude	5.63 (2.48)[b]	4.24 (2.36)[b]
	Evaluation	5.35 (2.67)[a]	4.36 (2.39)[a]

		High AR	Low AR
Experiment 2A[2]	Attitude	5.47 (2.02)[c]	4.64 (2.17)[c]
	Evaluation	5.50 (2.12)[c]	4.43 (2.19)[c]
Experiment 2B[2]	Attitude	5.65 (2.02)[c]	4.49 (2.08)[c]
	Evaluation	5.69 (2.15)[c]	4.55 (1.99)[c]

		High-Loyalty Condition		Low-Loyalty Condition	
		High AR	Low AR	High AR	Low AR
Experiment 3	Attitude	5.37 (2.01)[b]	4.94 (1.85)[b]	4.85 (2.04)[b]	5.10 (1.93)[b]
	Evaluation	5.40 (2.02)	4.88 (1.87)	4.83 (2.03)	4.98 (1.89)

NOTE. – 1: Means collapsed across levels of the relationship-length factor.
2: Means collapsed across levels of the repurchase-frequency factor.
Means sharing the same letter indicate statistical significance at or below .05(a), .01(b), .001(c).

Table 2.2

Mediation Analysis for Consumer Attitude and Firm Evaluations (Experiment 1A – 2B)

Experiment 1A	**Consequent**															
	M_1 (Redundancy)				M_2 (CO)				Y_1 (Attitude)				Y_2 (Evaluation)			
Antecedent	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI
X (AR)	-2.04***	.40	-2.82	-1.25	1.61***	.39	.83	2.39	-.04	.52	-1.06	.99	.30	.45	-.59	1.19
M_1 (Redundancy)	–	–	–	–	-.25**	.09	-.43	-.06	.09	.12	-.14	.32	.04	.10	-.16	.24
M_2 (CO)	–	–	–	–	–	–	–	–	1.06***	.13	.81	1.32	.90***	.11	.67	1.12
Experiment 1B	**Consequent**															
	M_1 (Redundancy)				M_2 (CO)				Y_1 (Attitude)				Y_2 (Evaluation)			
Antecedent	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI
X (AR)	-2.49***	.61	-3.72	-1.26	1.95**	.70	.55	3.36	-.17	.70	-1.60	1.25	-.65	.72	-2.10	.81
M_1 (Redundancy)	–	–	–	–	-.33*	.15	-.64	-.02	.09	.15	-.21	.39	.06	.15	-.25	.37
M_2 (CO)	–	–	–	–	–	–	–	–	1.17***	.15	.87	1.48	1.07***	.15	.76	1.38
Experiment 2A	**Consequent**															
	M_1 (Redundancy)				M_2 (CO)				Y_1 (Attitude)				Y_2 (Evaluation)			
Antecedent	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI
X (AR)	-2.80***	.41	-3.61	-2.00	1.50***	.33	.85	2.15	.37	.46	-.54	1.27	.79	.48	-.15	1.73
M_1 (Redundancy)	–	–	–	–	-.26***	.06	-.39	-.14	.29***	.09	.12	.46	.30***	.09	.12	.47
M_2 (CO)	–	–	–	–	–	–	–	–	.95***	.12	.71	1.18	.98***	.12	.74	1.23
Experiment 2B	**Consequent**															
	M_1 (Redundancy)				M_2 (CO)				Y_1 (Attitude)				Y_2 (Evaluation)			
Antecedent	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI
X (AR)	-2.10***	.45	-2.99	-1.21	2.04***	.42	1.20	2.88	.04	.52	-.99	1.06	.35	.52	-.67	1.37
M_1 (Redundancy)	–	–	–	–	-.27**	.09	-.44	-.10	.13	.10	-.07	.32	.12	.10	-.07	.31
M_2 (CO)	–	–	–	–	–	–	–	–	1.00***	.11	.78	1.22	.84***	.11	.63	1.06

NOTE. – * p < .05, ** p < .01, *** p < .001

Table 2.3

Mediation Analysis for Consumer Attitude and Firm Evaluations (Experiment 3)

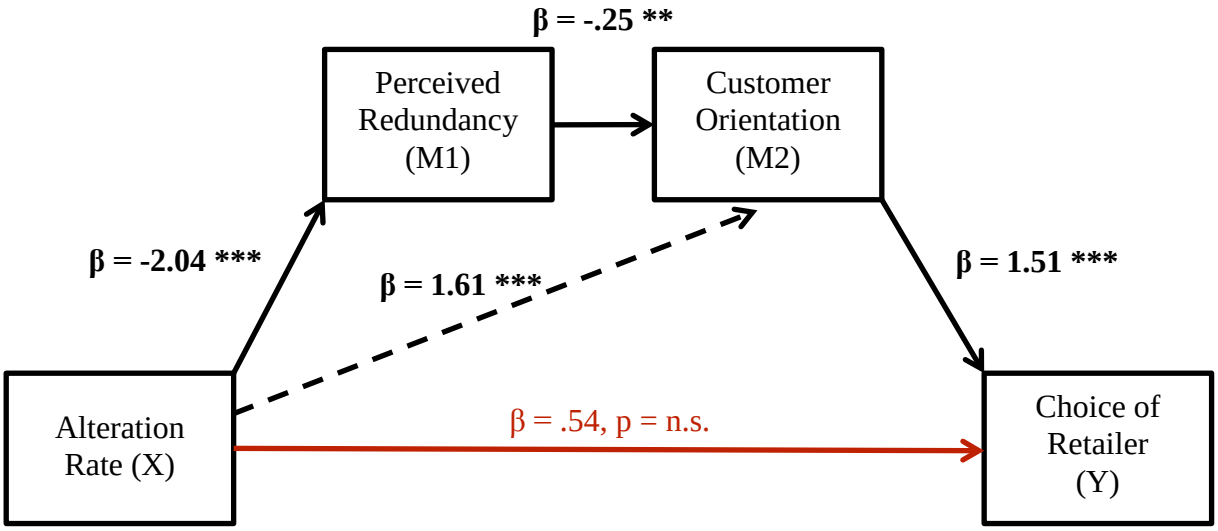
Model 1	**Consequent**															
	–				–				Y_1 (Attitude)				Y_2 (Evaluation)			
Antecedent	–	–	–	–	–	–	–	–	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI
X (AR)	–	–	–	–	–	–	–	–	.76*	.34	.10	1.42	.94**	.35	.26	1.61
W (Brand Loyalty)	–	–	–	–	–	–	–	–	.43	.34	-.24	1.08	.49	.34	-.19	1.16
XW	–	–	–	–	–	–	–	–	-1.17*	.49	-2.14	-.22	-1.15*	.48	-2.10	-.23

Model 2	**Consequent**															
	M_1 (Redundancy)				M_2 (CO)				–				–			
Antecedent	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI	–	–	–	–	–	–	–	–
X (AR)	-.67***	.18	-1.02	-.32	.70**	.26	.22	1.22	–	–	–	–	–	–	–	–
W (Brand Loyalty)	–	–	–	–	.29	.24	-.18	.75	–	–	–	–	–	–	–	–
XW	–	–	–	–	-.80*	.35	-1.49	-.14	–	–	–	–	–	–	–	–
M_1 (Redundancy)	–	–	–	–	-.19*	.09	-.35	-.02	–	–	–	–	–	–	–	–

Model 3	**Consequent**															
	–				–				Y_1 (Attitude)				Y_2 (Evaluation)			
Antecedent	–	–	–	–	–	–	–	–	Coeff.	SE	UUCI	HLCI	Coeff.	SE	UUCI	HLCI
X (AR)	–	–	–	–	–	–	–	–	.22	.30	-.37	.79	.38	.31	-.23	.99
W (Brand Loyalty)	–	–	–	–	–	–	–	–	.22	.31	-.37	.83	.29	.30	-.30	.86
XW	–	–	–	–	–	–	–	–	-.58	.42	-1.42	.22	-.54	.41	-1.36	.27
M_1 (Redundancy)	–	–	–	–	–	–	–	–	.09	.10	-.08	.29	.10	.10	-.09	.30
M_2 (CO)	–	–	–	–	–	–	–	–	.73***	.14	.45	1.00	.75***	.14	.47	1.03
M_2W	–	–	–	–	–	–	–	–	-.05	.19	-.42	.34	-.08	.18	-.43	.28

NOTE. – * p < .05, ** p < .01, *** p < .001

Figure 2.1
Two-Stage Mediator Model



** p < .01
*** p < .001

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CHAPTER 3

SELECTIVE PROCESSING OF PRODUCT FEATURES IN SPACED AND MASSED PRESENTATION: THE INFLUENCE OF ATTRIBUTE ALIGNABILITY ON ADVERTISING REPETITION AND MEMORY[3]

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Abstract

Prior research has shown that the effectiveness of advertisement repetition on consumer's recall of ad information is contingent on the amount of time available to process information between presentations. It is often reported in the literature that spaced presentations (i.e., presentations interspaced by time or other stimuli) leads to superior learning and recall of repeated information than massed presentation (i.e., presentations in succession). In this research, I develop a theoretical framework to describe how massed and spaced presentation that involve interspacing of advertisements trigger distinct information processing strategies which, in turn, influence learning and recall of repeated information. Drawing upon research in information processing strategies and selective attention, I show that the spacing of stimuli presentation triggers distinct information processing strategies (i.e., elaboration or distinctiveness) which, in turn, influence the type of information to which individuals attend (i.e., alignable or nonalignable product features). Overall, I propose that massed presentation results in superior recall for alignable product-attribute information whereas spaced presentation results in superior recall for nonalignable attributes.

Introduction

A significant amount of research on the effectiveness of marketing communications has been focused on the influence of repetition on communication effectiveness (Burke and Srull 1988; Cacioppo and Petty 1979; Calder and Sternthal 1980; Malaviya 2007; Malaviya et al. 1999). The bulk of research in this domain consistently finds that repeated exposure to marketing stimuli is a key factor influencing consumers' ability to later recall the advertised product or service (Cox and Cox 1988; Unnava and Burnkrant 1991; Zielske 1959). In addition to the number of exposures, it has also been proposed that consumer's ability to recall information from advertisements depends on the spacing of the presentations (i.e., time length between repetitions). In this line of research, it has been predominantly shown that memory and recall for advertisement information is superior when the repetition of advertisements is spaced rather than massed (i.e., spacing effect; for a meta-analysis on spacing effects see Janiszewski et al. 2003).

Despite the robustness of the spacing effect, one important gap in the literature is that while massed and spaced repetitions are defined as being presented in immediate succession or with an *interval separated by either time or by other advertisements*, the vast majority of research that supports a positive spacing effect has been based *time intervals only*. In addition, recent research focusing on the role of learning paradigms (i.e., verbal learning versus experimental learning; Lakshmanan et al. 2010) questions the robustness of the spacing phenomenon by showing conditions under which spacing does not seem to provide advantages in terms of recall of information.

In this research, I develop a theoretical framework to describe how massed and spaced presentation that involve interspacing of advertisements trigger distinct information processing strategies (i.e., elaboration or distinctiveness) which, in turn, influence learning and recall of

repeated information. Drawing upon research in information processing strategies (level-of-processing theory; Craik and Lockhart 1972) and selective attention (structural-alignment; Gentner 1983), I argue that the comparison process elicited by the presentation of a set of advertisements directs an individual's attention toward either alignable or nonalignable product attributes depending on the spacing structure of the presentation.

Conceptual Development

Timing of Advertisement Repetition

An essential role of advertising is to inform and persuade consumers with the goal of increasing the likelihood that consumers will be more likely to purchase from the advertising brand than from a competitor. One factor that has received considerable attention from researchers is the effect of advertisement repetition on communication effectiveness since Zajonc's (1968) seminal work. It has long been recognized that repeated exposure to advertisements is a crucial factor influencing consumers' ability to later recall the advertised product or service (Cox and Cox 1988; Unnava and Burnkrant 1991; Zielske 1959). For example, repetition of an advertisement has been shown to increase the likelihood that a brand name is remembered (Craig et al. 1976; Unnava and Burnkrant 1991) and the strength of association between brands and their attributes (Burke and Srull 1988).

In addition to the mere number of exposures, it has also been demonstrated that effectiveness of repetition on consumer's memory of the advertisement depends on how the advertisement is repeated. In terms of advertisement repetition, a marketing stimulus can be presented either in immediate succession (i.e., massed presentation, Noel and Vallen 2009) or

with an interval separated either by time or by other advertisements (i.e., spaced presentation, Appleton-Knapp et al. 2005;Tzeng 1973). A large bulk of the literature in this domain reports a significant advantage of spaced repetition over massed repetition in terms of enhanced encoding and recall of marketing communication information (Janiszewski et al. 2003). For example, increasing the time interval between ad presentations can enhance the development of cues that are associated with the target product for later retrieval (i.e., encoding variability hypothesis; Glenberg 1979). Also, distributing presentations over a certain time interval can enhance one's memory for the advertisement because it allows the audience to rehearse the information received from the early presentation prior to the exposure to the subsequent presentation (i.e., rehearsal hypothesis; Rundus 1971).

To date, the vast majority of research supporting the advantage of spaced presentations has focused on studying spacing effects from a time interval perspective without consideration of intervals created by other stimuli. This is an important issue from a marketing standpoint as it is highly unlikely that consumers will encounter advertisements in absence of additional competing persuasive attempts. Thus, it remains to be answered under what conditions massed or spaced presentation involving interspacing of advertisements will enhance recall of brand information. In this research, I argue that consumers tend to become more selective to what information they attend as perceptual load increases through stimuli repetition. To be specific, I propose that consumers activate distinct information processing strategies in the face of repeated information and that these strategies may determine the extent to which spaced or massed presentations enhance recall.

Selective Attention and Advertisement Repetition

A cornerstone of the literature in memory systems is that repeated associations or experiences in the environment enhance learning (Hintzman 1976). This fundamental property of human memory has been explored extensively and has yet to be disputed, with recent research sharing the view that learning and memory are indeed sensitive to repetition (Greene 2008). However, given the challenge that consumers face in daily situations regarding the selection of relevant information from a vast amount of marketing attempts, subsequent work explores the role of perceptual load in selective attention (Lavie 1995). The general consensus stemming from this stream of research is that increased perceptual load (i.e., either through the increase in number of different items that need to be perceived, or the increase in perceptual demand for the same items), drives people to process task-relevant information while ignoring task-irrelevant information (Lavie 2005; Norman and Bobrow 1975).

When considering the role of advertisements, a common task that is often presented to consumers is to learn about competing options in the market while comparing product features to form preferences. There are two types of information that consumer may utilize according to research in consumer-preference formation and choice. One way consumers can form their preferences is by focusing on alignable differences, defined as attributes that are related to common aspects between the options (Markman and Gentner 1996). For example, imagine two brands of humidifiers, one which emits warm moisture and one which produces cool mist. As both properties serve the same function of producing moisture, this product attribute can be considered as an alignable difference since each attribute corresponds to a matching relation (emission type) between the brands. On the other hand, nonalignable differences are attributes unique to each individual option (Markman and Gentner 1996). For example, one brand of

humidifier might be known to have a night-time display dimmer, a feature that is not communicated by the competing brand.

Whereas both alignable and nonalignable attribute information may be used for comparison purposes, I argue that, in line with the findings from the literature on selective attention, consumers may favor one type (either alignable or nonalignable differences) over the other depending on situational factors of the task at hand, especially as perceptual load increases through stimuli repetition.

Information Processing Strategies and Advertisement Repetition

Theories in information processing strategies posit that learning occurs not just as an automatic response to the environment, but through active and strategic processing of the information available (Bousfield 1953). In particular, the level-of-processing theory (Craik and Lockhart 1972) posits that the way individuals process information determines the extent of their learning, and that learning through repetition without any attempt to attach meaning to the information (e.g., rote memorization) has limited benefits in terms of the duration and accessibility of information in memory. From this perspective, two types of encoding strategies, elaboration and distinctiveness have been identified to aid individuals when they learn new information (Craik and Lockhart 1972; Craik and Tulving 1975; Eysenck 1979). Elaboration refers to the process of making connections between new and old information based on similarities (Craik and Lockhart 1972) whereas distinctiveness refers to the process of creating or becoming aware of the differences between new and old information (Eysenck 1979). The basic premise underlying both types of strategies can be connected to the principle of congruity (Schulman 1974), which states that memory enhancement depends heavily on the level of

integration between the current items with a context. Although both elaboration and distinctiveness can be an effective mean to learn new information, there are situational factors that have been shown to determine the way people create meaningful or semantic connections.

In order for elaboration to be an effective mean of storing new information, the elaborative connections must be clear and easy to identify (Kim and Van Dusen, 1998). In other words, the new information must be presented in a context that makes the similar properties of the comparable information more salient. When the familiarity of a stimulus and conceptual knowledge of the product category increases, the elaborative process becomes somewhat automatic, in the sense that the network of concepts is easily accessed (e.g., primed) and connections based on similarities are made between the new information and existing knowledge of the concept (Craik and Lockhart 1972). Alternatively, it has been found that distinctiveness-based processing occur when newly learned concepts have some unique characteristics that help differentiate them from other concepts (Eysenck 1979). Interestingly, for people to respond to learning tasks with a distinctiveness-based perspective, it has been shown that the presentation of new information simply needs to be unique or different regardless of the fact that the discriminating features are semantically meaningful (Craik and Lockhart 1972).

Based on the theoretical argument that stems from the information processing strategies and selective attention, I propose that consumers will respond differently to the repetition of an advertisement by incorporating different encoding strategies when processing new information. For example, when considering the repeated exposure to two advertisements from competing brands A and B, consumers could be exposed to the advertisement from Brand A repeatedly without the interference of Brand B in a massed presentation (AAABBB), whereas a spaced presentation would involve a mixed order of presentation, alternating the advertisements between

each repetition (ABABAB). In either case, the initial exposure of Brand A's advertisement acts as the anchor point on which conceptual knowledge of the product category is built upon.

When considering massed presentation, the repetition sequence (AAABBB) is more likely to increases the probability that consumers will be able to create richer cognitive structures around the first stimulus (ad of Brand A) before being exposed to the second stimulus (ad of Brand B). Recent research supports this assertion, finding that the retrieval of learned information without spacing (by either time or other information) strengthens the connections built around the concept, lowering the susceptibility to information decay and interference (Abel and Bäuml 2014). Therefore, by allowing consumers to build familiarity and conceptual knowledge beforehand, massed presentation should aid the processing of new information via elaboration-based learning, as consumers can then easily access the network of concepts and make connections based on similarities between the new information and existing knowledge of the concept (Craik and Lockhart 1972). Alternatively, spaced presentation exposes consumers to a different advertisement per repetition (ABABAB). Given that distinctive-based learning, relative to elaboration-based learning, is more likely to occur when elements in the environment cue the existence of unique characteristics that distinguish the information from prior knowledge (Craik and Lockhart 1972), it is plausible to hypothesize that spaced repetition will enhance consumers' recall of advertisements through distinctiveness-based learning. Stated formally:

H1: When advertisement repetition is massed (vs. spaced), consumer learning will occur through elaboration (vs. distinctiveness), resulting in selective attention and learning of alignable (vs. nonalignable) attributes.

General Discussion

Counter to the prevailing knowledge in prior literature, I propose that massed presentation, in addition to spaced presentation, may also lead to better recall of repeated information. I develop a theoretical framework to describe how massed and spaced presentation induces different types of information processing strategies, leading consumers to more selectively process repeated information. In response to calls for research to gain better understanding of the underlying mechanisms of the spacing effect, I connect the literatures on advertisement repetition effects and information processing strategies and provide new insights that examine their joint effects on learning and recall. Overall, this research may be of particular importance for products and services in which the attributes (alignable vs. nonalignable) used by consumers to form their preferences among choice options is well known.

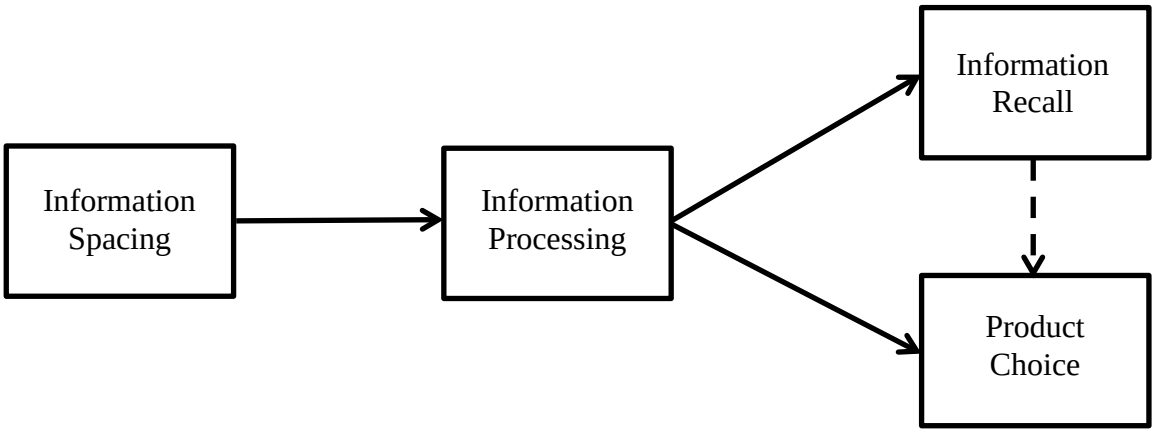
The next step for future research would be to start the empirical investigation of the proposed account, showing that massed (vs. spaced) presentation can enhance consumers' recall of advertisements through elaboration (vs. distinctiveness)-based learning, resulting in superior recall of alignable (vs. nonalignable) product attribute information. In order to test whether consumers utilize an information processing strategy based on elaboration (versus distinctiveness) when exposed to a massed (versus spaced) presentation, one could repeatedly presented participants with two advertisements featuring a list of product description (equal numbers of alignable and nonalignable attributes) for two products. In selecting a target product, a series of pretest should be conducted with the goal to identify a stimulus product category that the participants have low familiarity with and moderately favorable attitudes toward. This would be desirable because it should enhance the likelihood that subjects base their judgments primarily on the information presented in the target advertisements (Malaviya et al. 1999). Print ads may

be considered because they afford greater experimental control, are characterized by a great deal of competitive advertising, and typically contain much product information (Keller 1987).

For the main experiment, participants will be randomly assigned to a condition within the 2 levels of information spacing (massed vs. spaced) by 2 levels of attribute alignability (alignable vs. nonalignable) mixed design with information spacing manipulated as between-subjects. A cover story will inform participants about a hypothetical scenario involving the purchase of a product. Participants will be asked to imagine that they are shopping for a certain product and that they were able to narrow down their consideration set to two options currently being advertised through the mass media. Participants will then review the advertisements of the two product one at a time on the computer screen. Participants will be told that the advertisements for each product would be presented multiple times in randomized order to ensure that they had enough exposures to each product. For the manipulation of information spacing, participants will view the advertisements of each product multiple times in separate screens based on the specified order (massed vs. spaced). Participants will then complete a short filler task to ensure that the later recall of advertisement information is more likely to involve retrieval of information from long-term memory (Keller 1987). Also, the use of a common unrelated distractor task administered to all participants after their exposure to the advertisements should help eliminate potential recency effects by minimizing the respondents' continued thoughts about the advertisements (Lakchmanan et al. 2010). Following the filler task, participants will be asked to participate in an unanticipated aided recall task regarding the product attributes presented in the ads. The dependent measure will be the number of correct recall for each attribute type (alignable vs nonalignable). Although information recall is often used as a proxy for attention in the information-processing literature (Barlow and Wogalter 1993; Raghubir and Valenzuela 2006;

Shaw et al. 2000), a direct test of whether participants indeed utilize an information processing strategy based on elaboration (versus distinctiveness) when exposed to a massed (versus spaced) presentation can be done by utilizing eye-tracking research (Chandon et al. 2009; Russo and Leclerc 1994; Van Diepen, De Graef, and d'Ydewalle 1995; Wedel and Pieters 2008). This method would allow a direct measurement of visual attention, providing a more thorough and methodologically rigorous analysis regarding the extent to which the effects of various information spacing on selective attention carries through to information recall. Future research can also test the information spacing effect in a consumer choice context by creating a trade-off scenario between the two types of product attributes (e.g., manipulating higher preference toward alignable or nonalignable attributes). Through such research, one could potentially test whether participants learning new information through distinctiveness (elaboration) when repetitions are spaced (massed) not only results in enhanced recall for nonalignable (alignable) attribute information, but also drives consumer choice (see Figure 3.1).

Figure 3.1
Conceptual Model



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CHAPTER 4

THE INFLUENCE OF HORIZONTAL AND VERTICAL PRODUCT ATTRIBUTE INFORMATION ON DECISION MAKING UNDER RISK: THE ROLE OF PERCEIVED COMPETENCE[4]

[4] Min, Dong-Jun and Marcus Cunha Jr. Submitted to *Organizational Behavior and Human Decision Processes*. 01/18/2015.

Abstract

Classical decision theory assumes that risk is negatively associated with the attractiveness of an option. Thus, it is not surprising that individuals may seek to reduce the level of risk associated with a purchase by choosing an option based on information that allows a direct evaluation of objective product value. The present research proposes that, under risk, individuals prefer to make decisions based on information that they perceive themselves to be more knowledgeable as a result of a tendency toward favorable perceptions of their own competence. This could lead to choices with negative implications for one's own experienced utility. I demonstrate that, under higher levels of risk, decision makers increase their reliance on attributes that reflect their own personal preference than on attributes that unambiguously indicate a superior product when making a choice. This result is reversed when risk levels are lower or knowledge about performance attributes is increased.

Introduction

Imagine an individual shopping for a refrigerator. The choice of refrigerator may depend on a variety of factors, including product attributes that directly influence the objective quality of the product (e.g., energy consumption) as well as product attributes that capture one's personal preference but do not necessarily influence the objective quality of the product (e.g., appliance color). Imagine also that this individual may face a trade-off between these two classes of features such as when, given a fixed budget or product availability, he or she may need to choose between a more energy efficient refrigerator featuring a color this buyer deems less desirable and a less energy efficient refrigerator featuring a color this buyer deems as a more desirable color. Now assume that this purchase decision occurs during a clearance sale where all sales are final, a situation that raises the perceived risk associated with the choice situation. Would the individual in this example choose the refrigerator that is more energy efficient featuring a less desirable color or the refrigerator that is less energy efficient featuring a more desirable color?

The situation above describes a consumer facing a trade-off between two very distinct classes of product attributes that have long been of interest to researchers in economics (Gabszewicz and Thisse 1986; Sutton 1986; Tremblay and Polasky 2002), namely vertical and horizontal attributes. Vertical attributes provide a basis for individuals to objectively rank products based on quality. For instance, if 100 consumers were asked to rank bed sheets ranging from 150 to 400 thread count in terms of softness (an objective quality[5]), the vast majority of consumers should rank the sheets closer to a 400 thread count at the top of the ranking and the ones closer to a 150 thread count at the bottom of the ranking. Assuming that softness of bed

[5] I use the term "objective quality" to keep consistency with the terminology used in the economics literature when discussing vertical versus horizontal attributes. In the context I study, quality implies attribute performance with respect to delivering the benefit rather than the extent to which the product is poorly/well made.

sheets is a desirable feature that positively correlates with thread count, the ranking of preference for sheets should strongly and positively correlate with the ranking of thread count. Alternatively, horizontal attributes provide only a subjective basis for individuals to rank products and, as a consequence, rankings are strongly influenced by personal tastes. For instance, if the same 100 consumers were asked to rank bed sheets in terms of desirability of the color/pattern of the fabric, it is very likely that there would be a great level of disagreement in the final ranking given that some consumers may prefer taupe over grey whereas other consumers may have the exact opposite color preference.

In this research, I propose that the answer to the question about the choice between the two refrigerators in the opening example depends on how one makes decisions when the decision invokes a perception of risk, defined as one's perception of the level of uncertainty and undesirability regarding the consequences of a decision (Cox and Rich 1964; Dowling and Staelin 1994; Fedorikhin and Cole 2004). Given that the standard assumption in the literature of decision making under risk implies that risk is negatively associated with the attractiveness of an option (March and Shapira 1987; Weber, Anderson, and Birnbaum 1992), one way an individual can reduce perceived risk is by focusing on information that increases the precision of estimates regarding the quality of each product's objective value relative to all other available options (Conchar et al. 2004; Erdem and Swait 2004; Peterson and Merino 2003; Taylor 1974). Based on this line of reasoning, it is plausible to expect that decision making under risk is more likely to be based on information that provides an objective ranking-based standard for product evaluation (e.g., energy efficiency, a vertical product attribute) rather than on information that does not allow for an objective product evaluation (e.g., refrigerator color, a horizontal product attribute). This view predicts that, as perceived risk increases, the individual in the opening example should

be more likely to base their purchase decision on the energy efficiency of the refrigerator because it is possible to generate an unambiguous ranking among the alternatives. According to this account, this individual should be more likely to choose the more energy efficient refrigerator with the less preferred color when facing higher (vs. lower) levels of risk.

An alternative account of how one would go about choosing between the refrigerators when facing risk is based on ambiguity aversion (Ellsberg 1961; Heath and Tversky 1991; Klein, Cerully, and Monin 2010). This effect suggests that the tendency to have favorable perceptions of their own competence may drive individuals to more positively value an attribute that reflects their own preference (i.e., one that they perceive themselves to be more knowledgeable and feel competent about), as such information can help increase one's feeling of certainty that the consequences of the decision are favorable (Cox 1967). As a result, greater levels of perceived risk could lead the individual in the opening example to more heavily base their purchase decision on the color of the refrigerator than on energy efficiency, increasing the likelihood of choosing the less energy efficient refrigerator with the more preferred color.

In this research, I have the goal of broadening the knowledge about how perceived risk influences the decision-making process when facing a trade-off between horizontal attributes and vertical attributes. In contrast to the predictions stemming from the literature on information evaluability and value sensitivity (e.g., Conchar et al. 2004; Hsee and Zhang 2010), I derive a competing hypothesis stemming from the literature on ambiguity aversion (Ellsberg 1961) and find in four experiments that preferences shift toward increased reliance on horizontal (vs. vertical) attribute information as perceptions of risk increase. This shift is consistent with the predicted competence mechanism (directly tested in experiment 2), even though individuals perceive vertical attributes as more valuable in increasing the chance of choosing the product that

provides the highest utility (pretest). The results also show that this shift is robust to varying types of risk, product categories, horizontal attributes, and vertical attributes. Taken together, these results are novel to the literature and provide a parsimonious account that can improve our knowledge of the boundaries of information utilization and decision making under risk.

Conceptual Development

Decision Making under Risk: Information-Evaluability Perspective

One general assumption in the literature on decision making under risk is that individuals tend to prefer larger over smaller expected returns and smaller risks over larger risks (Pratt 1964), resulting in stronger preference for alternatives that provide the highest estimation of product utility. Indeed, it is well-established that individuals may try to reduce perceived risk associated with the expected outcome by evaluating information that can be helpful in making more precise estimates of product value (Conchar et al. 2004; Erdem and Swait 2004; Peterson and Merino 2003).

When estimating product value, decision makers can rely on a multitude of product attributes that can be broadly classified into horizontal and vertical product attributes. Horizontal attributes are defined as those that reflect one's personal preference but do not necessarily affect the objective quality of the product (Gabszewicz and Thisse 1986). To illustrate, whereas someone may prefer a black finish for a refrigerator or a modern design for a watch, the performance of these products in terms of the ability to store and preserve food or to function at deeper sea depths does not vary relative to a white refrigerator or a watch featuring a traditional design. It is important to note that even if there is a refrigerator color that appeals to a broader

group of individuals (e.g., black finish), the ranking is still subjective and it could be influenced by future color trends and one could not rationally argue that the objective quality of a black refrigerator is higher than that of a white refrigerator. In contrast, vertical attributes provide a clear ranking-based standard for product performance in which a large majority of individuals agree on the ranking of the vertical feature (Sutton 1986; Tremblay and Polasky 2002). For example, all else being equal, very few people would disagree that a digital camera featuring 18.0-megapixel photo resolution provides higher quality images than one featuring 13.0-megapixels. Overall, the key difference between these two types of attributes lies in whether the attributes can be used to unambiguously rank the available product options based on an objective quality ranking.

With the distinct characteristics of each class of product attributes in mind, a case can be made that, in the face of greater levels of risk, decision makers are more likely to base their decisions on vertical attributes rather than on horizontal attributes as the former provides an objective means of evaluating a product among the choice options in regards to objective product performance. Therefore, decision makers seeking to reduce the amount of perceived risk associated with the purchase decision should show increased sensitivity to vertical attribute information because such attributes allow one to objectively identify the product with the highest utility given that these attributes are likely to be perceived as useful in decreasing the likelihood of a negative outcome. Hsee and Zhang's (2010) General Evaluability Theory also provides a theoretical basis for this prediction in the context of joint evaluations. Corroborating the core tenets of this theory, Hsee et al. (2013) find individuals to be more sensitive to pieces of information that allow for a direct comparison of their relative magnitude when comparing multiple options simultaneously rather than when each option is evaluated individually. To be

specific, attributes for which there is a general agreement of the desirable directionality of values (e.g., when larger values are always better than smaller values as it is often the case for vertical attributes) exert greater influence when people compare options simultaneously because these attributes make it is easier for one to judge which is the better option (Hsee et al. 1999). Following this line of reasoning, it can be hypothesized that:

H1a: Decision makers' reliance on vertical (horizontal) attributes should increase (decrease) as perceived risk increases

This prediction implies that the individual in the opening example will be more likely to choose the more energy efficient refrigerator featuring the less desirable color when facing higher levels of perceived risk than when facing lower levels of perceived risk.

Decision Making under Risk: Ambiguity Aversion and the Competence Hypothesis

Alternatively, prior research has proposed information-processing limitations that may hinder the decision-making process in terms of accurately estimating the utility of each available option and selecting the option that most likely maximizes product value (Bettman, Luce, and Payne 1998). For instance, when choice formulations involve a trade-off between risk and expected return, it has been found that decision makers tend to prefer an option with fewer unknown elements than one with many unknown elements (Ellsberg 1961; Heath and Tversky 1991; Klein, Cerully, and Monin 2010). This phenomenon, often referred to as ambiguity aversion (Ellsberg 1961), implies that individuals prefer known-risk over unknown-risk alternatives. In other words, the final choice not only depends on the degree of risk involved but also on the amount of precision with which the expected return can be assessed (Ellsberg 1961).

Although the ambiguity aversion hypothesis also assumes that risk is negatively associated with the attractiveness of an option, it makes unique predictions with respect to choice under risk. According to this hypothesis, people prefer alternatives in which the estimation of expected outcomes provides greater clarity *regardless of the actual outcome* (Ellsberg 1961) because such alternative increases the individual's subjective feeling of certainty that the consequences of the decision may be favorable (Cox 1967).

One popular account for the ambiguity aversion offered by Heath and Tversky (1991), the competence hypothesis, ascribes the source of ambiguity aversion to the decision maker's general knowledge and understanding of the relevant context. According to this hypothesis, ambiguity aversion results from people having favorable perceptions of their own competence, as it allows people to better justify their decisions regardless of the actual outcome. Such perceived competence may influence decision making under risk because people generally prefer outcomes over which they perceive to exert control (Goodie 2003; Howell 1971; Klein and Kunda 1994), which also leads to optimism about the outcomes resulting from controllable situations (Harris 1996). This prediction is supported by research showing that people are more likely to bet in domains with which they are more familiar (Brun and Tiegen 1990) and in contexts where they consider themselves more knowledgeable (Heath and Tversky 1991; Klein, Cerully, and Monin 2010). In addition, firms are more likely to charge higher prices for less ambiguous risk (Kunreuther et al. 1995) and consumers are willing to pay more for established brands (Kahn and Sarin 1988) or select a more established brand to avoid ambiguity (Erdem and Swait 1998; Muthukrishnan, Wathieu, and Xu 2009). Also, it has been proposed that individuals are more likely to allocate resources to activities that express higher certainty towards favorable outcomes (Sawyer 1990).

I argue that favorable views of one's own competence can lead to important shifts in preferences when decision makers face trade-offs between horizontal and vertical attributes. Given that horizontal attributes capture one's subjective valuation that is reinforced through increased familiarity and experience with the given context (Carpenter and Nakamoto 1989; Kahneman and Snell 1988; Tversky and Kahneman 1974), they may be perceived as information about which individuals deem themselves to be more competent. Based on the rationale underlying the competence hypothesis, I thus propose that individuals' tendency to have favorable perceptions of their own competence may lead them to place greater emphasis on horizontal attributes that reflect their own preference rather than vertical attributes that provide relative and objective values.

H1b: Decision makers' reliance on horizontal (vertical) attributes should increase (decrease) as perceived risk increases.

This prediction implies that the individual in the opening example will be more likely to choose the less energy efficient refrigerator featuring the more desirable color when facing higher levels of perceived risk than when facing lower levels of perceived risk.

I test these two competing hypotheses in four experiments. In experiment 1, I find that preference for products featuring a more desirable horizontal attribute and a less desirable vertical attribute increases as the level of perceived risk increases. In experiment 2, I provide evidence for the competence mechanism by showing that reliance on certain product attributes stems from favorable perceptions of perceived competence with that given attribute. In experiment 3, I rule out alternative explanations based on post-decision utility maximization and

social biases. In experiment 4, I broaden the scope of our research by demonstrating that the effect is robust across different decision settings.

Experiment 1

Experiment 1 was designed to test whether individuals shift the focus of their decision from horizontal attributes to vertical attributes or vice versa as the risk associated with the purchase increases. To conduct this test, I presented participants with a choice between two refrigerators featuring different appliance colors (horizontal attribute) and varying amounts of monetary savings associated with energy efficiency (vertical attribute). If reliance on vertical attributes increases in the face of greater levels of perceived risk as predicted by hypothesis 1, I should observe an increase in the proportion of participants who choose the refrigerator offering a larger amount of savings associated with energy efficiency and featuring the less preferred color. Alternatively, if individuals' perceive themselves as being more competent about horizontal attributes than about vertical attributes, greater levels of perceived risk should lead to an increase in the proportion of participants who choose the refrigerator featuring the preferred color and offering a smaller amount of savings associated with energy efficiency.

Method

Participants. Seventy-three participants (average age = 32; 52% female) were recruited from Amazon's Mechanical Turk (MTurk) in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to one of the two conditions of the between-subjects perceived risk-level factor (high vs. low). I manipulated perceived risk via retailer return-policy leniency, based on actual return policy statements currently used by major retailers. Participants in the high-risk condition were presented with a stringent return policy (i.e., exchange-only policy with no cash refunds, return period within 14 days from the date of purchase, original receipt required, return shipping charges and restocking fees the responsibility of the customer). Participants in the low-risk condition were presented with a lenient return policy (i.e., full cash refund, return period within 1 year from the date of item receipt, no receipt information required, no payment of shipping charges or restocking fees).

The two levels of appliance color selected were black versus white and the two levels of annual energy savings were $219 versus $279. Since it is critical that participants face a trade-off between the horizontal and the vertical attribute to test the competing hypotheses, I asked participants for their color preference (masked with multiple questions regarding preferences for other refrigerator features to decrease attribute salience) when purchasing a refrigerator prior to the risk manipulation and used that information to create trade-offs between the product options. The choice of levels for the vertical attribute was based on a pretest that showed a stronger preference for refrigerators with an annual energy savings of $279 than for refrigerators with an annual energy savings of $219 ($z = 3.85$, $p < .001$). Accordingly, the resulting product profiles between which participants made choices were a refrigerator featuring the less desirable color that generates annual energy savings of $279 and a refrigerator featuring the more desirable color that generates annual energy savings of $217. The two products imposed a trade-off between the horizontal, a subjective preference-based, attribute (color) and the vertical, an objective rank-

based, attribute (energy savings). I also asked participants to recall their preferred appliance color at the end of the experiment as an attention check.

The cover story informed participants about a shopping scenario involving the purchase of a refrigerator. Participants were asked to imagine that they were shopping for a refrigerator and had the chance to consider various models. Participants were asked to imagine that, after examining several refrigerators, they were able to narrow down their choice set to two refrigerators that most closely matched the energy efficiency specifications and appliance colors they had in mind and that were within their budget. Participants then reviewed the purchase policy and product information and were asked to choose between the two refrigerators.

The refrigerators were shown side by side on the computer screen and the presentation included information about the color of the appliance and the amount of annual energy saving. The order of the side of the screen on which each product and its respective description appeared was randomized per participant. Immediately following the presentation of information about the return policy and the two refrigerators, participants were asked to assume they had the financial resources to buy the refrigerator and indicate the refrigerator of their choice. Following the choice, perceived risk associated with the purchase was assessed on a scale ranging from 1 (not at all risky) to 7 (very risky).

Results

Seven participants failed the attention check by incorrectly recalling their preferred appliance color and were removed from the sample because they might not have faced a trade-off between the vertical and horizontal attribute. The proportion of participants who failed the

attention check did not vary systematically across levels of the risk factor (p >. 60). An analysis of the perceived risk showed that participants in the high-risk condition perceived higher levels of risk involved in the purchase situation ($M_{\text{High\_Risk}}$ = 4.62) than did those in the low-risk condition ($M_{\text{Low\_Risk}}$ = 2.31; $t(64) = 7.24$, $p < .001$), indicating a successful manipulation of perceived risk. The analysis of choice proportions revealed a statistically significant effect of the risk factor on the choice of refrigerator with participants choosing the refrigerator with the more desirable color and smaller amount of energy savings more often in the high-risk condition (52.9%) than in the low-risk condition (28.1%; χ^2 (1) = 4.20, $p < .05$). Overall, this result lends support for hypothesis 2, which predicts increased reliance on horizontal (vs. vertical) attributes when one faces greater levels of risk.

Discussion

The results of experiment 1 provide initial evidence indicating that participants facing lower levels of risk were more likely to make a choice based on vertical product attribute information (i.e., the amount of energy savings). However, when facing greater levels of risk, participants' preference increasingly shifted toward the product featuring a more desirable horizontal attribute (i.e., appliance color) and a less desirable vertical attribute. Overall, this finding is consistent with the competence account (H1b) and inconsistent with the information-evaluability account of choice under risk (H1a).

Although the evidence from experiment 1 is consistent with the claim that individuals rely on information about which they may deem themselves more competent when making a choice in the presence of risk, the evidence supporting the proposed mechanism may not be

unequivocal. To further examine the proposed underlying mechanism, experiment 2 aimed to show that reliance on certain types of attributes stems from favorable perceptions of one's own competence with that given attribute.

Experiment 2

The goal of experiment 2 was to provide additional evidence supporting the competence account and further examine the proposed underlying mechanism by showing that decision makers' reliance on certain product attributes stems from favorable perceptions of their own competence. To achieve this goal, I manipulated participants' level of competence on the vertical attribute and asked them to rank this attribute relative to nine other attributes (including the horizontal attribute) in terms of their perceived competence. If the competence mechanism indeed drives choice under risk as predicted, increased competence in the vertical attribute should lead to a reversal of the pattern of results in experiment 1.

Pretests

Since I intended to manipulate competence with respect to the vertical attribute, in experiment 2, I replaced the vertical energy efficiency attribute with a storage capacity attribute given the difficulty of manipulating competence about monetary savings from energy efficiency. Additionally, as the support for either of the competing hypotheses relies on the assumption that information that provides an objective means of evaluating a product in terms of performance (i.e., vertical attribute) increases the chance of choosing the product that provides the highest

utility, I ran a series of pretests to check whether individuals' lay theories indeed align with this assumption.

Results of a survey (N = 17; MTurk) showed that, all else equal (e.g., price, quality), overall capacity provided greater confidence of a good purchase than did appliance color ($M_{\text{Overall\_Capacity}} = 5.41$, $M_{\text{Appliance\_Color}} = 2.65$; $t(16) = 5.19$, $p < .001$), as measured by a 7-point scale following the question "How confident would you feel that you made a good purchase if you based the purchase decision on the 'Appliance Color (Overall Capacity)' alone?" A second pretest (N=15; MTurk) also confirmed that participants believe that the overall capacity attribute is more diagnostic in terms of predicting product performance. When asked "Which product feature helps you better predict that one refrigerator will perform better than the other?" participants' ratings were statistically significantly lower than the midpoint of the scale ($M = 2.27$, $t(14) = 4.84$, $p < .001$) on a scale ranging from 1(definitely overall capacity) to 7 (definitely appliance color). Overall, these results show that participants' lay theories about their own expected choice behavior are consistent with the information-evaluability perspective, in that reliance on vertical-attribute information should be greater than horizontal-attribute information as it allows one to objectively identify the product offering the highest utility.

Method

Participants. Eighty-two participants (average age = 38; 54% female) were recruited from MTurk in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to a condition within the two levels of risk (high vs. low) by two levels of learned competence (learning vs. no-learning) between-subjects design. A key difference in the selection of stimuli compared to experiment 1 was that I changed the levels of the horizontal attribute with the goal of increasing the likelihood that participants would face a true trade-off without the need to collect upfront color preference to avert self-selection biases. For the horizontal attribute, the refrigerator colors were black and stainless steel whereas for the vertical attribute the storage capacities were 24.1 cubic feet and 31.0 cubic feet, a selection based on pretests that showed that a greater proportion of participants preferred refrigerators with a stainless steel finish (81.0%) rather than refrigerators with a black finish (19.0%; $z = 5.12$, $p < .001$). The pretest also showed that a larger proportion of participants preferred refrigerators featuring larger storage capacity (31.0 cubic feet; 87.1%) rather than refrigerators featuring smaller storage capacity (24.1 cubic; 12.9%; $z = 6.16$, $p < .001$).

The experiment began by informing participants that they would take part in a series of unrelated studies. As a cover story, I introduced the first portion of the survey as a study aimed to assess how people process information they encounter in daily life. In the learned-competence condition, participants were asked to examine information about appliances (information extracted from a consumer buying guide; stimuli presented in the appendix). Each participant was presented with three pieces of information related to the purchase of a refrigerator, including information about the vertical product attribute (e.g., average storage capacity needed based on family size, number of shelves, and bins). The other two features, included to disguise the goal of the learning task, referred to style and design (e.g., the difference between alternative designs such as side-by-side or French door) and the efficiency of refrigerators (e.g., what it means to be

Energy Star certified). I selected these features because they are information commonly used by consumers when making a purchase decision for refrigerators. The goal of this learning phase was to improve participants' competence about the vertical attribute by making them knowledgeable that larger refrigerator capacity translates into the ability to store greater amounts of perishable items, which is an obvious improvement in product performance for a refrigerator (an assumption confirmed by the pretest which demonstrated stronger preference for larger storage capacity). In the no-learning condition, I asked participants to take part in a filler task unrelated to the key portion of the experiment that was calibrated to take roughly the same amount of time required to complete the learning task.

Following the introductory task, participants were asked to take part in a second study involving the choice of refrigerator as in experiment 1. Following this choice, I asked participants to rank order 10 product attributes they felt most knowledgeable about (ranging from 1 (most knowledgeable) to 10 (least knowledgeable)) when using the attributes to make a suitable purchase decision. In addition to the two target product attributes (color and capacity), I included eight other filler attributes (e.g., number of doors, ice maker, and Energy Star qualification) for participants to rank. The goal of this measure was to capture the participants' perceived competence about refrigerator attributes.

Results

Manipulation Check. An ANOVA on the perceived risk measure show no effect of the learning manipulation on risk ($F(1,78) = .65$, $p > .40$) and no interaction between the learning and the risk factors ($F(1,78) = 1.49$, $p > .20$). There was, however, a statistically significant

effect of the risk factor on perceived risk with participants in the high-risk condition perceiving higher levels of risk involved in the purchase situation (M_{High_Risk} = 4.79) than did those in the low-risk condition (M_{Low_Risk} = 1.85; $F(1,78) = 98.17$, $p < .001$), indicating a successful manipulation of perceived risk.

Choices. A generalized linear model with a binary logistic link function analysis of the choice of refrigerator revealed a significant interaction between the risk and learning factors (β = -2.49, Wald $\chi^2(1) = 6.06$, $p = .01$). In the no-learning condition, participants were more likely (marginally significant) to choose the refrigerator with the more desirable color and smaller capacity in the high-risk condition (45.0%) than in the low-risk condition (20.0%; Wald $\chi^2(1) = 3.07$, $p = .08$), a result consistent with hypothesis 2 and with the pattern of results found in experiment 1. In contrast, when participants' competence about the vertical product attribute was raised, I observed a reversal of the choice proportions found in experiment 1. Participants were less likely to choose the refrigerator with the more desirable color and smaller capacity in the high-risk condition (18.2%) than in the low-risk condition (45.0%; Wald $\chi^2(1) = 3.76$, $p = .05$; see Figure 4.1).

Process Measure. To test the role of one's perceived competence on choice, I ran an ordinal logistic regression on the ranking of perceived competence about the vertical attribute, the attribute that was the focus of the learning manipulation. Ordinal logistic regression was used given that the dependent variable is ordinal and the magnitude of differences between ranks (e.g., first and second versus ninth and tenth) is likely non-constant. This analysis revealed a

significant interaction between the risk and learning factors (χ^2 (1) = 5.66, $p < .05$). An examination of the predicted probability of an upward increase in attribute ranking showed that, in the learning condition, overall capacity had a marginally significant probability of being ranked higher in the high-risk condition (49.6%) than in the low-risk condition (25.9%; χ^2 (1) = 3.35, $p = .07$). In contrast, in the no-learning condition, overall capacity had a marginally significant probability of being ranked higher in the low-risk condition (37.5%) than in the high-risk condition (19.7%; χ^2 (1) = 2.63, $p = .10$). This pattern of perceived competence with the vertical product attribute along with the reversal in choice proportions across learning conditions is consistent with the competence hypothesis.

Discussion

Experiment 2 replicated the results of experiment 1 by showing increased reliance on the horizontal attribute as perceived risk increased when participants were not exposed to information that increased their competence about the vertical product attribute (no-learning condition). Interestingly, this pattern of results emerge despite participants' own intuition that their choice should be based on vertical attributes because such attributes provide an objective means of evaluating a product among the choice options in regards to actual product performance and increase the likelihood of selecting the option that provides the highest product utility, as found in the pretest. In contrast, when I exposed participants to information about the vertical attribute (learning condition), I observed that increases in the level of risk led participants to rely more heavily on the vertical attribute. This resulted in an increase in the choice proportion for the refrigerator featuring a larger capacity and less desirable color,

reversing the pattern found in experiment 1. Combined with the results from the attribute rankings, the results of experiment 2 are consistent with the view that people's favorable perceptions of their own competence play an important role in choice under risk.

Experiment 3

One potential alternative to the findings in experiments 1-2 is that participants were more conservative in their choice decision under a strict return policy and therefore put more weight on the horizontal attribute information. For instance, it could be the case that an additional property of the horizontal and vertical product attributes is that whereas the post-decision utility for a horizontal attribute may be well known (as it reflects personal preference), the post-decision utility of a vertical attribute may only be fully revealed after the product has been purchased and used. Thus, there is always a chance that the vertical attribute may turn out to be less useful than expected, thereby creating a situation where an individual may prefer to return the product that was superior on the vertical attribute. If the costs associated with the product return are high (i.e., high-risk situation), decision makers may play it safe and assign a larger weight to the horizontal attribute in guiding their choice. Alternatively, if the costs associated with the product return are low (i.e., low-risk situation), one may be willing to try out a product that is superior on the vertical attribute, knowing that the product can be returned if that attribute turns out to be less valuable than expected.

One can also argue that the results of experiments 1-2 may reflect one's tendency to act to gain approval from others and avoid criticism when facing greater levels of risk, thereby shifting the decision maker's attention toward attributes that may be more favorably judged by others. For example, it could be the case that participants perceived a greater likelihood of the

horizontal attribute (i.e., appliance color) being noticed by others in comparison to the vertical attribute (i.e., energy savings or capacity), leading them to choose the refrigerator that is more likely to match the preference of a broader audience regarding the horizontal attribute, a form of social approval management.

In experiment 2, I addressed these two alternative accounts and broadened the scope of our research by replacing the refrigerator purchase scenario with a financial investment scenario (i.e., a non-social context where the choice outcome is unlikely to be observed by others) where risk was manipulated via investment return (i.e., pure financial risk unrelated to one's ability to return the product).

Method

Participants. Ninety-one participants (average age = 31; 32% female) were recruited from MTurk in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to a condition within the two levels of perceived risk (high vs. low). The procedure was similar to the previous experiments with a few key differences. First, I used a financial investment scenario in which participants were asked to choose between a financial institution featuring a less desirable sustainability initiative (horizontal attribute) and offering larger number of monthly transactions that were free of additional charges (vertical attribute), and a financial institution featuring a more desirable sustainability initiative and offering a smaller number of monthly transactions

that were free of additional charges. Second, the pairing of attributes was generated based on participants' upfront stated preference for five different levels of the horizontal attribute (i.e., sustainability initiative) to ensure that participants faced an actual trade-off between the products' attributes. I asked participants to rank order five corporate social responsibility initiatives (i.e., environmental responsibility, human and workplace rights, community support, youth giving, charitable giving) with which they preferred a financial investment institution to be involved (ranging from 1 (most preferable) to 5 (least preferable)). I then used the ranking of initiatives to create a trade-off between the two product attributes. In sum, participants were asked to choose between a financial institution featuring the least desirable sustainability initiative and offering 15 monthly transactions free of additional charges and a financial institution featuring the most desirable sustainability initiative and offering 12 monthly transactions free of additional charges (a pretest showed a statistically significant preference for 15 transactions; $z = 7.63$, $p < .001$). Third, I manipulated risk via return on investment (i.e., financial risk) using high financial risk in the high risk condition (i.e., 0% annual return with 50% chance and 10% annual return with 50% chance) and low financial risk in the low-risk condition (i.e., 5% annual return with 100% guarantee).

Results

Participants in the high-risk condition perceived higher levels of risk involved in the investment situation ($M_{\text{High\_Risk}} = 4.65$) than did those in the low-risk condition ($M_{\text{Low\_Risk}} = 3.38$; $t(89) = 4.39$, $p < .001$), indicating a successful manipulation of perceived risk. An analysis of the choice of financial institution revealed a statistically significant effect of the risk factor with

participants being more likely to choose the financial institution with the more desirable sustainability initiative and smaller number of monthly transactions in the high-risk condition (67.4%;) than in the low-risk condition (33.3%; χ^2 (1) = 10.56, $p < .001$). This pattern of choice proportions is consistent with the patterns found in the previous experiments showing a participant's increased reliance on horizontal (vs. vertical) attributes when faced with greater levels of risk, even in a context involving pure financial risk and low likelihood of social biases.

Discussion

Experiment 3 provides further support for hypothesis 2 by ruling out the alternative explanation based on post-decision utility maximization and social biases. The results showed that an increase in the level of perceived risk led participants to more heavily base their decision on the horizontal attribute, resulting in an increase in the choice proportion for the financial institution featuring a more desirable sustainability initiative and a smaller number of free monthly transactions, replicating the pattern found in the previous experiments.

Experiment 4

The goal of experiment 4 was to provide additional evidence that the effects of perceived competence on decision making under risk are robust across different choice contexts. To that end, I replaced the refrigerator-choice purchase scenario used in experiments 1 and 2 with a decision about choosing between two digital cameras featuring different brand names (horizontal attribute) and varying magnitudes of photo resolution (vertical attribute). The choice of brand

name as the horizontal attribute was based on several reasons. First, brand name is commonly used in the economic literature as a horizontal attribute (Stavins, 1995; Tremblay & Polasky, 2002; Wolinsky, 1987; Yang & Ye, 2008) as there are many markets in which the consumers' rankings on the available brands are not monotonic (i.e., different consumers have different preferences) and there is little difference between products in terms of quality. Second, the use of brands may be of high relevance to business decision makers as the results may help firms to better understand their positioning strategies within a given market. For example, in a market where there is fierce competition (e.g., pharmaceutical market) and consumers lack the information that enables them to differentiate the objective quality of the products available, the findings may suggest that it would be profitable for a generic brand to enter the market while communicating information that either helps to reduce perceived risk (e.g., lower drug prices) or create a positive vertical differentiation (e.g., percentage of patients who positively responded to the treatment). Conversely, brand-name manufacturers may benefit from using advertising that builds a brand image that better appeals to their consumers, creating a subjective distance between themselves and their competitors on the horizontal characteristic.

Method

Participants. A total of 120 participants (average age = 35; 53% female) were recruited from MTurk in exchange for monetary compensation.

Design, Procedure, and Stimuli. Participants were randomly assigned to a condition within the two levels of perceived risk (high vs. low). Perceived risk was manipulated through

the retailer's return policy as in experiment 1, but this time participants made a choice between two digital cameras that imposed a trade-off between the brand name (horizontal attribute) and photo resolution (vertical attribute). Based on prior research (Parker and Schrift 2011) and on a series of pretests using participants from the same population as the main experiment, the two brand names of digital cameras selected were Canon and Nikon and the two levels of photo resolution were 18.0-megapixels and 16.2-megapixels. Participants rated both brands as high-quality cameras when compared with the midpoint of the scale (M_{Nikon} = 7.38, $t(23) = 6.69$, $p < .001$; M_{Canon} = 7.33, $t(23) = 6.89$, $p < .001$) on a 1 (Very bad quality) to 9 (Very good quality) scale but these ratings did not vary across brands ($t(23) = .33$, $p > .35$). Participants from the same population as the main experiment indicated a higher preference for Nikon's brand reputation relative to Canon's (M_{Nikon} = 6.14, M_{Canon} = 5.72, $t(28) = 2.05$, $p < .05$) on a 7-point scale. Combined, these results imply that the preference for Nikon over Canon was likely based on subjective personal preferences rather than on an objective quality standard. In a forced-choice task, participants indicated their preference for digital cameras with resolution of 18.0-megapixels (81%) over cameras with resolution of 16.2-megapixels (19%; $z = 5.12$, $p < .001$). Thus, the resulting product profiles that were likely to create a trade-off between the vertical and the horizontal attribute were a Nikon camera with a resolution of 16.2 megapixels resolution and a Canon camera with a resolution of 18.0 megapixels. I also ran a second version of this same experiment where the product profile was developed based on upfront self-selected preferences of brand name as in experiment 1 and 3. As it will be reported later, there were no statistically significant differences between these two versions of the experiment and their data were combined following Edgington's (1972) and Rosenthal's (1978) guidelines.

Results

Manipulation Check. An analysis of the perceived risk showed that participants in the high-risk condition perceived higher levels of risk involved in the purchase situation (M_{High_Risk} = 4.45) than did those in the low-risk condition (M_{Low_Risk} = 2.18; $F(1,116) = 69.35$, $p < .001$), and this perception did not vary as a function of the version of the study as indicated by the lack of statistical significance of the interaction between the risk factor and the study version ($F(1,116) = 0.89$, $p > .30$) and of the main effect of the study version ($F(1,116) = .01$, $p > .90$), indicating a successful manipulation of perceived risk.

Choices. An analysis of the choice of cameras revealed a significant effect of the risk factor with participants being more likely to choose the digital camera featuring the preferred brand name and lower resolution in the high-risk condition (32.8%) than in the low-risk condition (14.5%; $\chi^2(1) = 5.58$, $p < .05$), a result consistent with the patterns found in the previous experiments showing an increased reliance on horizontal attributes when faced with greater levels of risk. There was no effect of the study version on choice proportions ($\chi^2(1) = 0.05$, $p > .80$), and the test of the interaction between these two variables also showed lack of statistical significance (Wald $\chi^2(1) = 0.30$, $p > .55$).

General Discussion

Understanding how decision makers process relevant purchase information (e.g., product attribute information) when choosing from a number of competing alternatives is important as it

improves our knowledge about decisions on key drivers of choice. As acknowledged in most cognitive decision-making models, however, it is relevant not only to uncover the type of product information on which individuals base their decision when assessing the value of the offering, but also the relative importance of these pieces of information in the final decision (Bettman, Luce, and Payne 1998; Drolet 2002; Johnson and Meyer 1984; Markman and Loewenstein 2010; Zhang and Markman 2001). This research adds to the stream of literature by examining choices of products and services featuring attributes that reflect one's personal preference (but does not necessarily influence the objective quality of the product) – horizontal attributes – and attributes that directly influence the objective quality of the product and provide a clear ranking-based standard for product evaluation – vertical attributes – under risk.

The central finding that decision makers shift the focus of their decision from attributes that unambiguously signal greater product utility (i.e., vertical attribute) to attributes that reflect personal preference (i.e., horizontal attribute), or vice versa, depends on the level of perceived risk associated with a decision. I found across four experiments that when decision makers face trade-offs between these two classes of attributes they tend to increasingly rely on horizontal attributes as the risk associated with the decision increases. This finding is, to some extent, at odds with prescriptions of the information-evaluability perspective, which predicts that decision makers should increase their reliance on attributes that provides a direct and objective means of evaluating products in regards to product performance as a strategy to lower perceived risk and the subsequent potential of a negative outcome. Instead, I was more likely to observe this pattern of behavior when participants faced lower levels of risk. I proposed and tested an alternative hypothesis that individuals systematically rely on information about which they may deem themselves more competent when making a choice involving greater levels of risk. Consistent

with the theorizing, I found in a series of experiments that choice proportions for products offering a more desirable horizontal attribute but a less desirable vertical attribute increased as perceptions of risk associated with the decision increased.

The findings provide evidence that this phenomenon is robust and reliable as the effect was observed across different choice contexts (product purchase and financial services), different types of horizontal attributes (appliance color, sustainability initiative, and brand name) and vertical attributes (storage capacity, amount of annual energy savings, number of monthly transactions free of additional charges, and camera resolution), and different types of risk manipulations (product return policy and financial investment return). Furthermore, I presented evidence for the underlying mechanism. In experiment 2, I directly manipulated the level of competence on the focal product attribute and predicted choice. I also addressed alternative explanations, including information salience, post-decision utility maximization, and social bias.

I believe that this work offers several important contributions to the literature. Applied to the stream of research in individual decision making, these findings demonstrate the importance of better understanding the shift in focus on the class of information in choice contexts where decision makers may face value trade-offs and risk. Intuitively, an inherent logic underlying the core tenets of the information-evaluability perspective is that choice may be driven by information that allows one to objectively identify the product offering the highest utility because the potential for a negative outcome resulting from the choice under risk should decrease. I also observed that, in absence of attribute trade-offs, individuals believe that they should indeed rely more heavily on information that provides a clear ranking-based standard for evaluation of options rather than on information that does not affect the actual performance of the options (pretest reported in experiment 2). However, despite this inherent belief, the resulting

formulation of choice under risk challenges this intuition and suggests that individuals may instead prefer to reduce risk by increasing the self-assessed feeling of certainty that that the consequences of their choice will be favorable and rely more heavily on their perceived competence, than on information that provides means of evaluating the options in terms of objective product performance. As a result of this risk-reduction strategy, I observed that decision makers may make choices with negative implications for their own overall experienced utility.

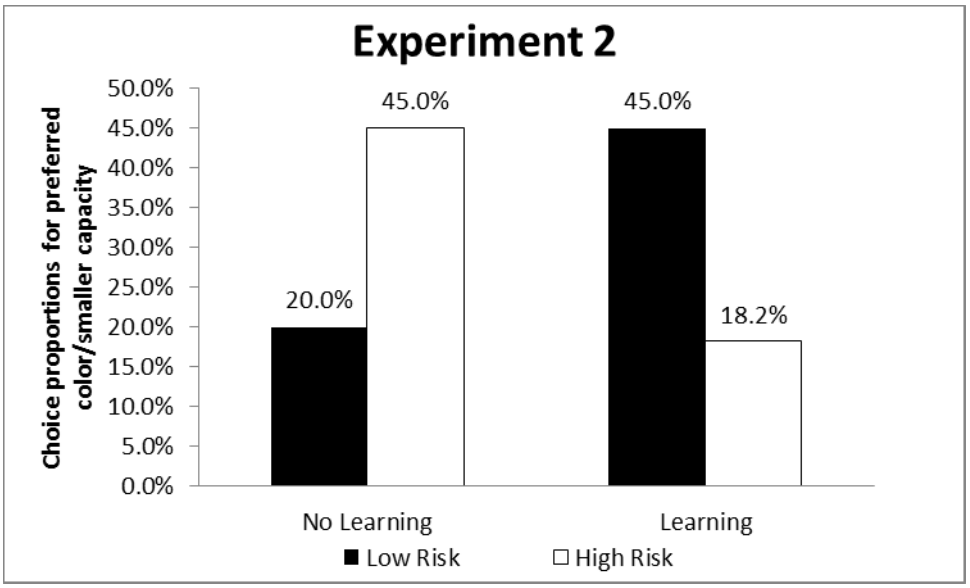
Applied to practice, this research also provides valuable insights to business decision makers as I offer a better understanding of how choice can be influenced by variables that are under marketers' control. Overall, the results suggest that, all else being equal (e.g., production costs), horizontal differentiation may be an effective product differentiation strategy under some circumstances. For instance, the results could be of particular importance for products and services for which the value proposition is based on vertical attributes about which individuals may not feel particularly competent (e.g., internet speed, processor capacity, camera resolution). To the extent that choices involve dealing with comparably higher levels of risk, which is often the case because decision makers are forced to choose just one option from a large number of alternatives that are immediately and/or potentially available without a full understanding of the consequence of the choice decision, marketers should ensure the availability of product options based on horizontal product attributes that pertain to aspects of individual taste (e.g., color, shape, design). This would increase the probability of individuals purchasing products and likely benefit the firm if it already possesses the capability to offer such variety of products based on horizontal attributes at a relatively lower cost. The findings may also be of use to advertisers and

advertising agencies, which often have to select a subset of features when communicating their value proposition to the market.

Although the results are consistent with a competence-based perspective of choice formulation under risk, I believe that future research should test this proposition across different types of risk. The framing of our risk manipulation is, perhaps, more relevant to a subset (performance and/or financial risk) of the five types of risk (performance, financial, social, psychological, physical) that Jacoby and Kaplan (1972) identified. Although performance and financial risk explain more variation of overall perceived risk than any other type of risk (Kaplan, Szybillo, & Jacoby, 1974), it would be interesting to further investigate decision-making processes under different classes of risk. For example, it could be the case that a purchase situation involving a comparison between branded versus generic products presents performance risk owing to the expected variability in the quality of non-branded products. In such cases, we may see results similar to those presented in current research. However, the salience of physical risk could be heightened when individuals with a focus on healthy behavior consider consuming packaged food products (e.g., nutritional information). Also, categories highly associated with the identification of social class (e.g., salience of status symbols) may elicit social risk. In these cases, the increase in perception of different risks may lead to results that differ from those found in this research.

Figure 4.1

Choice Proportions for Refrigerator with More Desirable Color and Smaller Capacity.



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CHAPTER 5

CONCLUSION

How do consumers respond to marketing communication as well as other elements of the marketing mix? As stated by Day and Montgomery (1999), understanding how consumers really behave (e.g., how is consumer choice influenced by the persuasive efforts and marketing variables that marketers control?) is considered one of the four fundamental issues in marketing that, if better understood, can progress the field to a higher level of relevance and influence. With this goal in mind, my dissertation, broadly speaking, aims to extend our knowledge about the cognitive processes (i.e., the mental action or process of acquiring, understanding, and remembering information) that precede judgment and decision making by exploring the contextual factors that influence the way consumers' process information. More specifically, I investigated how the structure of persuasive attempts systematically influences consumer's perceptions, processing of information, attitudes and behavior.

In Chapter 2, I examined how people interpret and make predictions based on previous data or experiences (e.g., sequence of coupons received from a retailer in the past few months). Research on people's ability to distinguish between patterns and randomness has persisted for quite some time (e.g., randomness cognition; Olivia and Oppenheimer 2008), as a key feature of human judgment is the ability to make predictions based on the meanings derived from what we see and experience. As a central part of cognition that has been known to have important implications, prior research in this area has shown that a key determinant of how people judge the subjective randomness or likely source of a given sequence of outcomes is the rate of how

often the sequence switches from one to another (i.e., alteration rate; Ayton and Fischer 2008). In this research, I developed a theoretical framework that examines how this perceived randomness influences consumer's perception and interpretation of the marketing communication, and replicated the effects across a number of marketplace experiences. Overall, I showed that firms may benefit from communicating with their consumers using a sequence that is perceived more likely as randomly developed (e.g., each consumer received different sequence of promotions) as it signals a focus on customer orientation.

In Chapter 3, I conceptualized how the order in which marketing information is presented affects consumer's processing and recall of information. Prior research in this stream of literature has often reported that spaced presentations (i.e., presentations interspaced by time or other stimuli) leads to superior learning and recall of repeated information than massed presentation (i.e., presentations in succession). Despite the robustness of the spacing effect (Janiszewski et al. 2003), the vast majority of research supporting the advantage of spaced presentations has focused on studying spacing effects from a time interval perspective without consideration of intervals created by other stimuli. In this research, I developed a theoretical framework to describe how massed and spaced presentation that involve interspacing of advertisements trigger distinct information processing strategies (i.e., elaboration or distinctiveness-based learning) which, in turn, influence learning and recall of repeated information. Drawing upon research in information processing strategies (Craik and Lockhart 1972) and selective attention (Gentner 1983), I proposed that the comparison process elicited by the presentation of a set of advertisements directs an individual's attention toward either alignable (i.e., attributes that are related to common aspects between the options) or nonalignable product attributes (i.e., attributes unique to each individual option) depending on the spacing structure of the

presentation. Counter to the prevailing knowledge in prior literature, I proposed that massed presentation, in addition to spaced presentation, may also lead to better recall of repeated information.

Finally, in Chapter 4, I investigated the conditions under which consumers based their choice on either a ranking-based standard (vertical attribute) or on personal preference (horizontal attribute). One of the most general approaches to studying consumer choice under risk is based on the assumption consumers tend to prefer larger over smaller expected returns and smaller risks over larger risks (Pratt 1964), resulting in stronger preference for alternatives that provide the highest estimation of product utility. Therefore, when making purchase decisions under risk, one way via which consumers can reduce uncertainty associated with the expected outcome is by acquiring information that can help them to make more precise estimates of the product value (Conchar et al. 2004; Erdem and Swait 2004; Peterson and Merino 2003). Based on this line of reasoning, prior research suggests that consumers' choice formulation under risk should be based on information that provides a clear ranking-based standard for product evaluation (e.g., a camera's resolution; a vertical product attribute) rather than on information that does not affect the actual performance of the product (i.e., a camera's design, a horizontal product attribute). In this research, I offered an alternative account of choice under risk which predicts that consumers facing trade-offs between horizontal and vertical attributes shift their focus from vertical to horizontal product attribute information when the purchase involves higher levels of risk. Drawing upon research on ambiguity aversion (Ellsberg 1961), I showed that consumers' favorable perceptions of their own competence may lead consumers facing higher levels of risk to more positively value an attribute that reflects their own preference but that does not necessarily improve product performance than an attribute that unambiguously indicates

product performance. These results showed that, all else equal (e.g., production costs), horizontal differentiation (i.e., differentiation based on consumers preferences) may be more effective than vertical differentiation (i.e., differentiation based on rank-ordered attributes) in purchases involving higher levels of risk.

Overall, my dissertation contributes to the literatures in information processing and consumer choice by shedding light into novel factors that may affect consumers' psychological response to stimuli. I believe that the study of this area is of high importance and relevance to the field of marketing as it examines consumers' psychological response to stimuli and events in the consumer environment, and provides marketers with the knowledge needed to ensure that consumer's reaction to marketing communications are in line with the marketer's intentions.

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APPENDICES

Appendix A

SEQUENCES OF OUTCOMES (CHAPTER 2 - PILOT STUDY)

AR Level	Sequence
0.3	@ @ @ % % % % $ $ $ # # # # $ & & & & @
0.5	@ @ @ $ & % # # & & & # # $ % % % % $ $ @
0.7	@ @ % & # $ % % # $ $ & & # & $ # % % @ @

NOTE. – All sequences were created using a random number generator

Appendix B

PROMOTION SEQUENCE - PET SUPPLY RETAILER

(CHAPTER 2 - PILOT STUDY, EXPERIMENTS 1A-2B)

AR Level	
0.3 AR	0.7 AR
$15 OFF Pet Health Product	$15 OFF Pet Health Product
$15 OFF Pet Health Product	$15 OFF Pet Health Product
$15 OFF Pet Health Product	$5 off select Bags of Wellness Natural Dry Pet Food
$5 off select Bags of Wellness Natural Dry Pet Food	Up To 25% Off Grooming Supplies
$5 off select Bags of Wellness Natural Dry Pet Food	40% Off Small Animal Toys, Treats & More
$5 off select Bags of Wellness Natural Dry Pet Food	Save 20% Off Dental Solutions
$5 off select Bags of Wellness Natural Dry Pet Food	$5 off select Bags of Wellness Natural Dry Pet Food
$5 off select Bags of Wellness Natural Dry Pet Food	$5 off select Bags of Wellness Natural Dry Pet Food
Save 20% Off Dental Solutions	40% Off Small Animal Toys, Treats & More
Save 20% Off Dental Solutions	Save 20% Off Dental Solutions
Save 20% Off Dental Solutions	Save 20% Off Dental Solutions
40% Off Small Animal Toys, Treats & More	Up To 25% Off Grooming Supplies
40% Off Small Animal Toys, Treats & More	Up To 25% Off Grooming Supplies
40% Off Small Animal Toys, Treats & More	40% Off Small Animal Toys, Treats & More
40% Off Small Animal Toys, Treats & More	Up To 25% Off Grooming Supplies
Save 20% Off Dental Solutions	Save 20% Off Dental Solutions
Up To 25% Off Grooming Supplies	40% Off Small Animal Toys, Treats & More
Up To 25% Off Grooming Supplies	$5 off select Bags of Wellness Natural Dry Pet Food
Up To 25% Off Grooming Supplies	$5 off select Bags of Wellness Natural Dry Pet Food
Up To 25% Off Grooming Supplies	$15 OFF Pet Health Product
$15 OFF Pet Health Product	$15 OFF Pet Health Product

NOTE. – 0.5 AR sequence was only presented in the pilot study and is available upon request

Appendix C

PROMOTION SEQUENCE - HOME APPLIANCE RETAILER

(CHAPTER 2 - EXPERIMENT 2B)

AR Level	
0.3 AR	0.7 AR
Up To 40% Off Clearance Items	Up To 40% Off Clearance Items
Up To 40% Off Clearance Items	Up To 40% Off Clearance Items
Up To 40% Off Clearance Items	5% off on Shower Accessories & Bath Décor
5% off on Shower Accessories & Bath Décor	10% off Major Appliances $399 or more
5% off on Shower Accessories & Bath Décor	Free 1 to 3-Day Shipping on Orders $49+
5% off on Shower Accessories & Bath Décor	20% off Select Small Appliances
5% off on Shower Accessories & Bath Décor	5% off on Shower Accessories & Bath Décor
5% off on Shower Accessories & Bath Décor	5% off on Shower Accessories & Bath Décor
20% off Select Small Appliances	Free 1 to 3-Day Shipping on Orders $49+
20% off Select Small Appliances	20% off Select Small Appliances
20% off Select Small Appliances	20% off Select Small Appliances
Free 1 to 3-Day Shipping on Orders $49+	10% off Major Appliances $399 or more
Free 1 to 3-Day Shipping on Orders $49+	10% off Major Appliances $399 or more
Free 1 to 3-Day Shipping on Orders $49+	Free 1 to 3-Day Shipping on Orders $49+
Free 1 to 3-Day Shipping on Orders $49+	10% off Major Appliances $399 or more
20% off Select Small Appliances	20% off Select Small Appliances
10% off Major Appliances $399 or more	Free 1 to 3-Day Shipping on Orders $49+
10% off Major Appliances $399 or more	5% off on Shower Accessories & Bath Décor
10% off Major Appliances $399 or more	5% off on Shower Accessories & Bath Décor
10% off Major Appliances $399 or more	Up To 40% Off Clearance Items
Up To 40% Off Clearance Items	Up To 40% Off Clearance Items

NOTE. – AR sequences are the same across conditions and only types of promotion vary.

Appendix D

PROMOTION SEQUENCE – GROCERY STORE (CHAPTER 2 - EXPERIMENT 3)

AR Level	Sequence
0.3	A A A P P P P P N N N A A A P P N N N N A
0.7	A A P N A N N P A P P N N A N P N P P A A

NOTE. – ‘A’ = coupon for ABLIXA toothpaste, ‘P’ = coupon for PERIOE toothpaste, ‘N’ = No coupon.

Appendix E

STIMULI FOR LEARNING CONDITION (CHAPTER 4 - EXPERIMENT 2)

Refrigerator Buying Guide

1. Style and Design

TOP MOUNT

The top mount refrigerator has the freezer at eye level with the fresh food compartment at the bottom. Traditionally this has been the most common type of refrigerator.

BOTTOM FREEZER

The bottom mount freezer is a good option for households that want fresh food selections at eye level. This configuration also makes a lot of sense, since the freezer is typically used less than the fridge.

SIDE-BY-SIDE

The fridge and freezer compartments are adjacent to one another and allow easy access. If possible, select a model with adjustable bins & shelves so you can customize the layout to suit your needs.

FRENCH DOOR

An increasingly popular style of refrigerator that has dual refrigerator doors and a pull-out freezer drawer for convenient fresh & frozen food storage. Combines the best features of bottom mount and side-by-side.

2. Efficiency

In a typical household, the refrigerator can account for as much as 10 to 20 percent of total power you will use in one year.

New models that are Energy Star certified are extremely efficient, as refrigerators today typically use 30% less electricity than models built ten years ago.

3. Capacity

Consider the capacity of your current refrigerator and how well it fits your groceries before you decide to increase or decrease the size of your model.

- It is important to note that large families tend to require significantly more storage space than one or two people living in a small apartment.
- Overall, 26 - 31 cu. ft. of space should suffice for an average-sized family. If there are more, a good rule of thumb is to add around 1.5 cu. ft. per person, excluding freezer storage space.
- If you frequently entertain guests, look for a unit with greater storage capacity.
- The primary means of storing food in your refrigerator are bins, shelves, drawers and baskets. If you like to keep large amounts of milk or juice on hand, look for door bins capable of holding gallon-sized containers.
- Larger refrigerator capacity allows you to adjust shelving and easily create space for large dishes.

(EXAMPLE A) 25.9 CUBIC-FEET	**(EXAMPLE B)** 29.1 CUBIC-FEET
	
CAPACITY (Cubic Feet): • **Overall Capacity:** 25.9 • **Refrigerator Capacity:** 17.6 • **Freezer Capacity:** 8.3	**CAPACITY (Cubic Feet):** • **Overall Capacity:** 29.1 • **Refrigerator Capacity:** 19.7 • **Freezer Capacity:** 9.4
SHELVES & STORAGE: • **# of Freezer Door Bins:** 0 • **# of Freezer Shelves/Baskets:** 2 • **# of Refrigerator Door Bins:** 5 • **# of Refrigerator Drawers:** 3 • **# of Refrigerator Shelves:** 3	**SHELVES & STORAGE:** • **# of Freezer Door Bins:** 1 • **# of Freezer Shelves/Baskets:** 3 • **# of Refrigerator Door Bins:** 7 • **# of Refrigerator Drawers:** 3 • **# of Refrigerator Shelves:** 5