There's Only One Left, Do I Want It?

The Effects of Brand and Display Characteristics on Purchase Intentions for Scarce Products

by

Iana Alexandra Castro

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved November 2010 by the
Graduate Supervisory Committee:

Andrea Morales Ketcham, Chair
Stephen M. Nowlis
James C. Ward
Naomi Mandel

ARIZONA STATE UNIVERSITY

December 2010

ABSTRACT

This research explores the influence of brand and shelf display cues on consumer preferences for products that appear to be in scarce supply. In so doing, I develop a theoretical model of how scarcity operates in the retail environment, identifying when it increases purchase intentions, when it decreases purchase intentions, and the underlying mechanisms driving these outcomes. Across a series of five studies, I find that when consumers infer that products are scarce due to popularity, they are more likely to buy these products, but only when the products are unfamiliar nonfood brands. I also find that scarce products are less likely to be purchased when they are familiar food brands. In addition, the price of the product is an important moderator of these effects, as price further influences perceptions about the popularity of the product.

ACKNOWLEDGMENTS

I am grateful for the encouragement, help and unwavering support of my advisors, committee members and family, who have been with me every step of the way.

TABLE OF CONTENTS

Page

LIST OF FIGURES v

CHAPTER

1 INTRODUCTION 1

2 WHEN PRODUCT SCARCITY EITHER INCREASES OR DECREASES PURCHASE INTENT 5

Product Scarcity May Increase Purchase Intentions 5

Product Scarcity May Decrease Purchase Intentions 10

The Influence of Price as a Moderator 13

3 STUDY 1 - THE EFFECTS OF PRODUCT SCARCITY, POPULARITY AND BRAND FAMILIARITY ON PURCHASE INTENTIONS FOR NONFOOD PRODUCTS 16

Design and Procedure 16

Results 19

Discussion 24

4 STUDY 2 - THE EFFECTS OF PRODUCT SCARCITY, ORGANIZATION AND BRAND FAMILIARITY ON PURCHASE INTENTIONS FOR NONFOOD PRODUCTS 26

Design and Procedure 26

Results 28

Discussion 31

5 STUDY 3 - THE EFFECTS OF PRODUCT SCARCITY, ORGANIZATION AND BRAND FAMILIARITY ON PURCHASE INTENTIONS FOR FOOD PRODUCTS 33
Pre-Test 34
Main Study 35
6 STUDY 4 - THE EFFECTS OF PRODUCT SCARCITY AND PRICING ON PURCHASE INTENTIONS FOR FAMILIAR BRAND PRODUCTS 41
Design and Procedure 41
Results 45
Discussion 47
7 TRANSFER OF PRODUCT IMPRESSIONS TO STORE IMPRESSIONS 50
8 STUDY 5 - TRANSFER OF PRODUCT IMPRESSIONS TO STORE IMPRESSIONS 52
Design and Procedure 52
Results 53
Discussion 55
9 GENERAL DISCUSSION 56
REFERENCES 61
APPENDIX 65
A INSTITUTIONAL REVIEW BOARD APPROVAL FORM 66

LIST OF FIGURES

Figure Page

1. Figure 1 – Conceptual Model 9
2. Figure 2 – Manipulations of Popularity 17
3. Figure 3 – Stimuli for Study 1 18
4. Figure 4 – Study 1 Results: The Effects of Product Scarcity, Popularity and Brand Familiarity on Purchase Intentions for Nonfood Products 21
5. Figure 5 – Stimuli for Study 2 27
6. Figure 6 – Study 2 Results: The Effects of Product Scarcity, Organization and Brand Familiarity on Purchase Intentions for Nonfood Products 30
7. Figure 7 – Study 3 Results: The Effects of Product Scarcity, Organization and Brand Familiarity on Purchase Intentions for Food Products 38
8. Figure 8 – Stimuli for Study 4 44
9. Figure 9 – Study 4 Results: The Effects of Product Scarcity and Pricing on Purchase Intentions for Familiar Brand Products ... 48
10. Figure 10 – Study 5 Results: Transfer of Product Impressions to Store Impressions 54

Chapter 1

Introduction

"They have trained their customers to expect scarcity, leading to higher margins and more store visits."

- Rachel Dodes, *Wall Street Journal*

As the above quote notes, marketers believe that scarcity strategies can encourage consumers to buy their products. However, the current research finds that product scarcity can sometimes result in increased purchase likelihood, sometimes have no effect on purchase likelihood, and sometimes result in decreased purchase likelihood. These different effects are driven by cues in the retail environment, such as the presentation of the products on the shelf, and by differences in the products being displayed, such as the degree to which the brands are familiar, their price, and whether they are food or nonfood products.

Retail executives know that the presentation of their products matters. The general belief is that pristine aisles with fully stocked shelves and perfectly organized product displays can increase purchase intentions, whereas cluttered aisles with empty shelves and messy displays lower them. However, product displays can also serve as cues to product scarcity. Although retailers currently strive to keep shelves and displays fully stocked and organized in the belief that this will maximize sales, it may be the case that this, in fact, is not the best way to increase revenues. In this paper, I examine whether, and under what conditions,

the organization, appearance, type and number of products on retail shelf displays will impact consumer inferences about the scarcity of the products and their purchase intentions for them.

By looking at a product display, consumers are exposed not only to how scarce a product appears to be, but also to other factors that can influence whether that scarcity is perceived to be beneficial or harmful to the product's value. For example, imagine a consumer at a supermarket who is considering the purchase of a product from a disorganized display with only one product left on the shelf. Will the scarcity of the product and the appearance of the display interact in a way that systematically influences purchase intentions? Prior research in the scarcity literature suggests that scarcity attributed to market conditions (i.e., popularity) should increase the desirability of a product (Verhallen 1982; Verhallen and Robben 1994). However, most of this research has not focused on how the availability of the product interacts with other important cues in the retail environment to affect purchase intentions, nor how cues in the retail environment influence perceptions of scarcity. Thus, my research examines how cues in the retail environment, such as the appearance of the shelf or the familiarity of the brands on the shelf, interact with the availability of the product to influence purchase intentions. In the proposed scenario, the fact that the display is disorganized and that there is only one product left may suggest that others are buying the product; therefore, consumers may infer that the product is scarce due to popularity and preference for the product may increase. However, if consumers are familiar with the brand, then they may use other information about

the product to make their decisions, thereby reducing the effect of such cues and the scarcity of the product on purchase intentions.

Previous research on product scarcity has shown that when consumers believe that a product is scarce, their preference for the product may increase (Cialdini 1993). However, little prior work has examined how product scarcity may instead lead to a decrease in purchase intentions. In addition, although research on assortment has looked at topics such as the number or type of products sold in a store, the amount of space allocated to a category or product, shelf locations/displays, and stockouts (e.g., Boatwright and Nunes 2001; Borle et al. 2005; Chandon et al. 2009; Fitzsimons 2000; Turley and Milliman 2000), and the decision-making literature has focused extensively on how different aspects of a product or brand influence consumer preferences (e.g., Carmon, Wertenbroch, and Zeelenberg 2003; Leclerc, Hsee, and Nunes 2005; Yorkston, Nunes, and Matta 2010; Zhang and Sood 2002), little prior work has examined how different cues in the retail environment, and characteristics of the brand, may interact to influence perceptions of product scarcity or the preference for scarce products.

As such, my research offers three important contributions. First, I examine how specific cues in the retail environment, such as the organization (i.e., the messiness) of the shelf display, interact with the availability of the product (i.e., the number of products available in the display) to influence perceptions of popularity and purchase intentions. Second, I examine how the availability of the brand interacts with characteristics of the brand itself, such as its familiarity and whether or not it is a food product, to influence purchase

intentions. Third, I show how other characteristics of the brand, such as its price, moderate these effects and how these effects translate into impressions of the store selling the products. In so doing, I am able to develop a comprehensive theoretical model of how scarcity operates in the retail environment, identifying when it increases purchase intentions, when it decreases purchase intentions, and the underlying mechanisms that drive these outcomes.

Chapter 2

When Product Scarcity Either Increases Or Decreases Purchase Intent

In the next section, I consider cases where product scarcity might either lead to an increase or a decrease in purchase intentions. I also consider how the price of the product can moderate these effects.

Product Scarcity May Increase Purchase Intentions

Consumers can rely on various cues available in the retail marketplace to help them make purchase decisions (e.g., Kahn and Wansink 2004; Lemon and Nowlis 2002; Morales 2005; Nowlis, Dhar, and Simonson 2010). For example, a consumer in a store can use the appearance of shelf displays as a cue to the value of the products on those displays. One commonly available cue on store shelves is whether a product is fully stocked or scarce, such as when there is only one product left on a display. When a consumer notices that a product is not fully stocked on a store shelf (e.g., there is only one left), this can influence preference for the product. Prior research on product scarcity has shown that opportunities seem more valuable when they are less available (e.g., Brock 1968, Cialdini 1993). This reasoning is used frequently by marketers when producing limited edition products, using exclusive distribution outlets, or limiting consumers' ability to get products. Thus, when a consumer observes that a product is scarce, such as when there is only one remaining on a store shelf, this might increase the value placed on this item.

However, prior research on product scarcity has shown that limited availability, by itself, is not enough to signal that a product is more valuable. In

particular, research has found that products are evaluated more positively when scarcity is due to market circumstances (i.e., factors related to supply and demand), such as when a product is in high demand due to popularity, than when it is due to accidental or nonmarket circumstances (e.g., a product has not yet been restocked). Additionally, products that are scarce due to nonmarket conditions are not valued more than products unlimited in availability. Therefore, scarcity alone does not have an effect on preference; it is the consumer's perception of the cause for the scarcity that influences preference (Lynn 1992; Verhallen 1982; Verhallen and Robben 1994).

While prior research on product scarcity has shown that products will be seen as more valuable when scarcity is due to popularity than due to other factors, this work has not looked at how certain cues in the retail environment can also influence perceptions of scarcity. One obvious cue, as mentioned earlier, is the degree to which a product is fully stocked. However, there may be other cues that also influence perceptions of popularity. In particular, products on store shelves may not always be carefully organized, but instead may appear to be disorganized, messy, and out of place. This may also serve as a cue to popularity, since consumers might perceive that a messy shelf is one that many consumers have visited. As a result, shelves that are messy may also serve as a cue to product popularity, which may then influence purchase intentions.

Prior research has shown that product scarcity may influence perceptions of value by signaling product quality. In particular, people are influenced by the actions of others because they believe that others' decisions reflect information

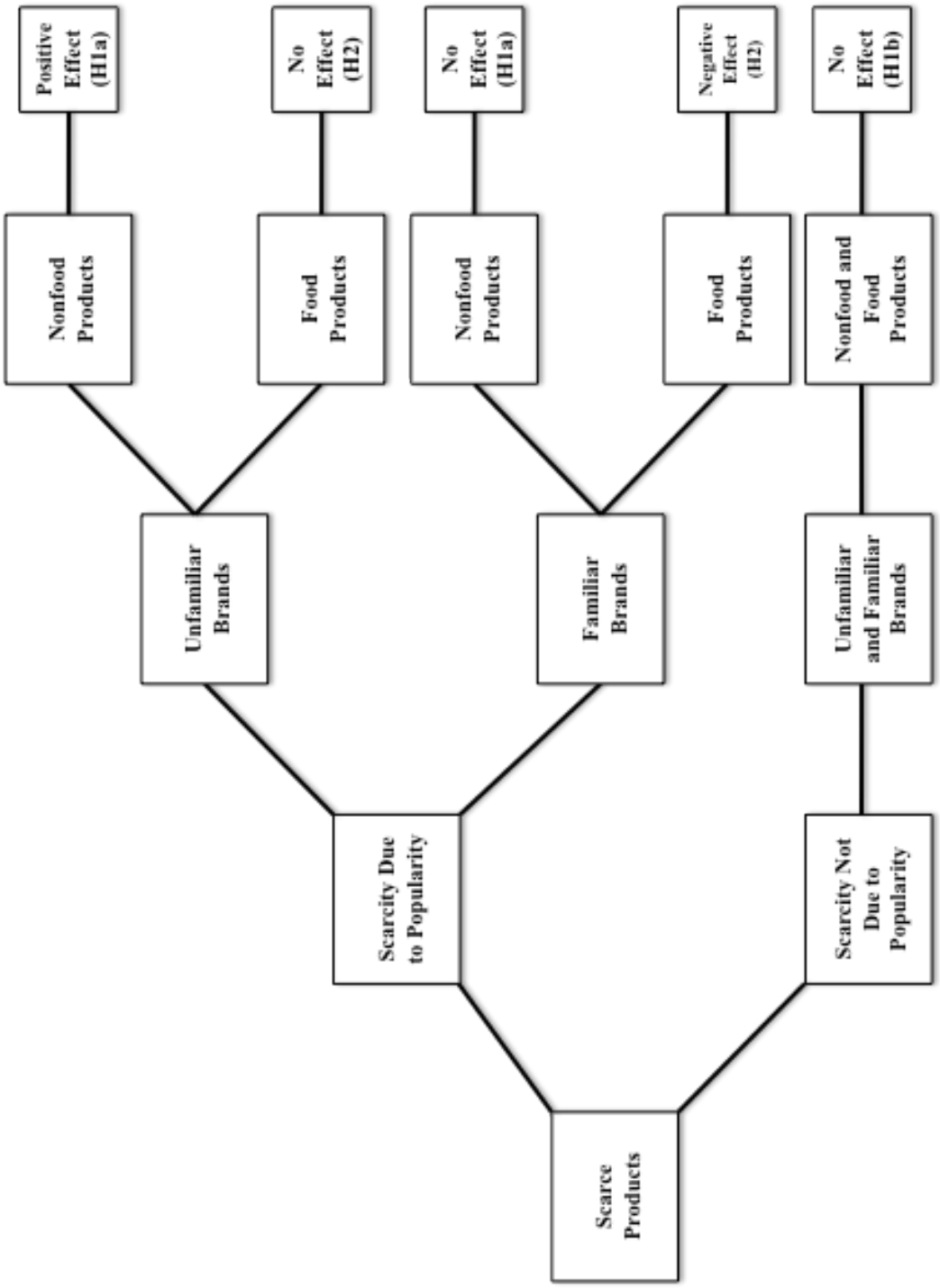
they do not possess (e.g., Banerjee 1992; Burnkrant and Cousineau 1975, Huang and Chen 2006). Therefore, product scarcity can signal to uninformed consumers that other, more informed consumers are buying the product, thereby leading uninformed consumers to have higher quality perceptions of the scarce products (Stock and Balachander 2005). However, prior research on scarcity has not examined the degree to which familiarity may influence the relationship between scarcity and purchase intentions. For example, consumers who are uninformed or unfamiliar with the available options may rely more on the behavior of others when making choices than consumers who already possess information about the available options. Therefore, I propose that when consumers infer that product scarcity is due to popularity, they do this by using information about a specific cue (i.e., there is only one left, so the product must be popular) to draw conclusions about a general property (i.e., therefore, the product must be of high quality) (e.g., Kardes, Posavac, and Cronley 2004). These inferences about product quality may affect consumer preferences for the scarce products. Furthermore, I propose that consumers are most likely to make these inferences when there is uncertainty regarding the brand choices, such as when consumers are unfamiliar with the product category and therefore unfamiliar with all the brands in a given category, or when consumers are familiar with the product category but unfamiliar with the specific brands carried by a particular store. However, if consumers are already familiar with the brands available, they should no longer need to rely on the behavior of others in order to make decisions. While the environmental cues may signal that the product is scarce and popular,

consumers should not make quality assessments based on this particular information and purchase intentions therefore should not be affected (Osselaer and Alba 2000) (see Figure 1 for an overview of my conceptual model). This leads to the first hypothesis:

H1a: When product availability is attributed to popularity, purchase intentions will be greater when product availability is scarce rather than abundant for unfamiliar brands, but not for familiar brands.

H1b: When product availability is not attributed to popularity, no difference in purchase intentions will emerge for unfamiliar brands or familiar brands across product availability conditions.

FIGURE 1 – CONCEPTUAL MODEL



Product Scarcity May Decrease Purchase Intentions

In H1, I predict that when consumers infer that product scarcity is attributed to popularity and consumers are unfamiliar with the available brands, purchase intentions will increase. This is expected to occur because consumers will look to the behavior of others to make quality inferences about the products and these inferences will inform their purchase decisions. While product scarcity due to popularity is expected to increase purchase intentions for unfamiliar brands, there might also be cases where product scarcity can lead to a *decrease* in purchase intentions. In particular, product scarcity due to popularity is not expected to influence the quality perceptions of familiar brand products; however, product scarcity due to popularity may lead consumers to make inferences about whether or not the products in the display (whether familiar or unfamiliar brands) have been touched or handled by other consumers, which in some cases might actually lead to a decline in purchase intentions because consumers may view the products as being contaminated. I next consider this possibility in more detail.

Recent work has shown that consumers can contaminate products in the marketplace through physical contact (Argo, Dahl, and Morales 2006). Specifically, when a consumer believes that another shopper has touched a product, the touched product is evaluated less favorably because it is viewed as having been contaminated, even if the product is objectively unharmed. Consumers feel disgusted thinking about other people touching the products they want to buy, and these feelings of disgust then transfer to the touched products,

resulting in lower evaluations. Importantly, consumer contamination does not require consumers to actually see other shoppers touching products, but rather, "contamination cues" in the retail environment may be enough to trigger the contamination process.

Interestingly, although negative contamination effects for packaged goods have been demonstrated between two products (Morales and Fitzsimons 2007), empirical evidence for consumer contamination is limited only to clothing (Argo, Dahl, and Morales 2006; Argo, Dahl, and Morales 2008). Moreover, prior contamination research has focused only on cases where the touched product was also the only one left in stock (i.e., scarce). Thus, it is unclear generally whether contamination also occurs when multiple products have been touched by others and specifically whether the contamination process results from the scarcity of the products, the salience of contamination, or the combination of both product scarcity and contamination together.

When products are fully stocked and there is evidence that they may have been handled by others (e.g., the display is messy and products are turned over), I propose that consumers may perceive that the products are contaminated. However, in this case, contamination will be spread out over multiple products, thus possibly decreasing the strength of any negative contamination effects. On the other hand, when there is only one product left on a shelf and consumers perceive others have touched it, then I expect significant contamination effects to arise. In other words, when a product is scarce, the salience of contamination is expected to be stronger than when the product is abundant because all of the

contamination is concentrated on a single product rather than spread out over multiple products (e.g., Latane 1981). Just as prior work supports the idea that more contamination sources increase the magnitude of contamination (Argo, Dahl, and Morales 2006), I argue in the current research that increasing the number of targets (i.e., the number of products being displayed) reduces the magnitude of contamination. Therefore, I propose the presence of a contamination cue alone will not be enough to elicit negative contamination effects; rather, it is perceived contamination together with product scarcity that is necessary to impact consumer preferences.

In addition to being stronger when there is only one product on the shelf, I propose that contamination effects will be largest for certain types of products. Because prior research has shown disgust to be the theoretical mechanism driving the contamination process and the strongest disgust reactions are elicited from food due to the high degree of intimacy between food and one's body (e.g., Angyal 1941; Frazer [1890] 1959), I expect that negative contamination effects will emerge for food products but not for nonfood products. Furthermore, as mentioned earlier, I expect that brand familiarity will moderate the degree to which store shelf cues impact purchase likelihood. I propose that, for unfamiliar brand food products, consumers will look to the behavior of others to make quality inferences regarding the products. These informational needs will lead to increased preference for products that are scarce due to popularity; however, given the consumable nature of the products, consumers will also experience feelings of disgust toward products that are scarce due to popularity, and the

feelings of disgust will lower their preferences for the same product. Therefore, the informational needs and the feelings of disgust will cancel each other out, and consumers will be equally likely to select the unfamiliar brand food products regardless of product availability. For familiar brand food products, however, I expect that consumers will not rely on display cues for information but they will respond negatively to contamination cues that signal that other consumers have handled the scarce products. This leads to H2:

H2: When product availability is attributed to popularity, purchase intentions will be lower when product availability is scarce rather than abundant for familiar food brands, but not for unfamiliar food brands.

The Influence of Price as a Moderator

H1 outlines situations where product scarcity is expected to increase purchase intentions and I argue these effects will occur due to inferences about product quality, while H2 discusses situations where product scarcity is likely to decrease purchase intentions and I argue these effects will result from inferences about product contamination. However, in addition to these two paths, it is important to consider whether other factors can also impact the relationship between product scarcity and purchase intentions.

In particular, I look next at the effects of price and price promotions. Prior research on product scarcity has not considered the influence of a product's price,

together with display cues, on consumer evaluations. However, I propose that prices often interact with variables I have already considered: the type of product and its availability. First, I anticipate that consumers will use price as a cue to indicate the popularity of a scarce product. If two products are priced the same, and yet one of the products is scarce, then consumers are expected to believe this is due to popularity, since the prices of the two competing products are equal. This change in perceptions of popularity should then influence purchase intentions. For example, for a familiar brand food product, this situation of product scarcity and equal prices should result in lower purchase intentions due to contamination, compared to a situation where the familiar brand food product is fully stocked.

Next, I consider how a price promotion will influence purchase intentions for a product that is scarce. In particular, as mentioned earlier, I propose that purchase intentions are likely to decline when a familiar brand food product is scarce, due to concerns about contamination. However, the disgust literature provides anecdotal evidence suggesting that people can overcome feelings of disgust and the ensuing reactions when there is a stronger or more immediate goal (Angyal 1941). Furthermore, prior work shows that the existence of a price promotion is considered to be one of the strongest motivators toward purchase (e.g., Lemon and Nowlis 2002; Neslin 2002). Thus, for familiar brand food products that are scarce, I expect that a price promotion will increase purchase intentions compared to a situation where a price promotion is not offered. In other words, H2 proposes that product scarcity will lower consumer interest in

familiar brand food products, due to concerns about contamination. However, I expect that product scarcity will no longer lower consumer interest in familiar brand food products when the scarce products are offered with a price promotion, as this price promotion is expected to override potential feelings of disgust. On the other hand, I do not expect that a price promotion will alter purchase intentions for familiar brand nonfood products that are scarce, since such a situation will not need to cancel out any negative effects from contamination.

H3: A price promotion will cancel the negative effect hypothesized in H2 for familiar food brands but will not have an effect on purchase intentions for familiar nonfood brands.

Chapter 3

Study 1 - The Effects Of Product Scarcity, Popularity And Brand Familiarity On Purchase Intentions For Nonfood Products

The purpose of this study is to establish the conditions under which shelf display cues will positively influence purchase intentions for the displayed products. The focus of this study is on nonfood products and I empirically test H1a and H1b.

Design and Procedure

Study 1 consisted of a 2 (product availability: scarce, abundant) x 2 (popularity: stated, control) x 2 (brand familiarity: familiar, unfamiliar) between subjects experimental design. Popularity was chosen given that it is a market condition that has been shown to increase the desirability of scarce products and it serves as a signal for later consumers that previous consumers are purchasing the product (Verhallen and Robben 1994). In all of the studies, participants looked at photographs of real product shelves from an actual supermarket, where the products displayed appeared undamaged. Each photograph displayed products for two competing brands in the same product category (e.g., Quilted Northern toilet paper and Cottonelle toilet paper). Pre-tests confirmed that there were no significant differences between the perceived price and quality of the brands selected for each product category. Product availability was manipulated by changing the quantity of the products displayed on the shelf for the focal brand (i.e., the brand participants were asked about). In the scarce product availability condition, the display contained one product for the focal brand, while in the

abundant product availability condition, the display for the focal brand was full. The display for the other brand in the photograph (i.e., the brand participants were not asked about) was always full and organized.

I manipulated popularity in this and future studies in different ways (see Figure 2). In this study, popularity was manipulated by telling participants directly about the sales success of the product. For example, in the stated popularity condition, the following text appeared below the photographs, "The Quilted Northern toilet paper on the shelf is the best-selling toilet paper in this store" (see top half of Figure 3). For the control popularity condition, no text appeared below the photographs (see bottom half of Figure 3). Finally, brand familiarity was manipulated by selecting brands that were either relatively familiar (e.g., Dawn and Palmolive) or unfamiliar (e.g., Seventh Generation and Citra-Dish) to the participants.

FIGURE 2 - MANIPULATIONS OF POPULARITY

Study 1: Respondents told about the product's success
Study 2: Scarcity and Disorganization
Study 3: Scarcity and Disorganization
Study 4: Scarcity and Equal Prices

FIGURE 3 – STIMULI FOR STUDY 1

Dishwashing Liquid

The **Dawn** dishwashing liquid on the shelf is the **BEST-SELLING dishwashing liquid in this store.**

A: Stated Popularity, Scarce Product Availability, Familiar Brand

Dishwashing Liquid

B: Control, Abundant Product Availability, Unfamiliar Brand

I randomly assigned one hundred and seventy seven participants, who participated in the study in exchange for extra credit in an undergraduate marketing course, to one of the eight experimental conditions and gave each of them a photograph booklet that contained photographs for five product categories—toothpaste, fabric softener, dishwashing liquid, toilet paper and multi-purpose cleaner. The questionnaire provided detailed instructions that asked the participants to, for example, "look at Picture 4 – Toilet Paper and answer the following questions as if you were at the store, standing in front of the shelf shown in the picture." Participants were asked, on seven-point scales, to indicate how likely they would be to buy a twelve-pack of Quilted Northern toilet paper from the shelf in the picture (endpoints of not at all likely and very likely), to rate the quality of the Quilted Northern toilet paper on the shelf in the picture (endpoints of very low and very high), to indicate their attitudes toward the Quilted Northern toilet paper on the shelf in the picture (endpoints of negative and positive and unfavorable and favorable), to rate the popularity of the Quilted Northern toilet paper on the shelf in the picture (endpoints of very unpopular and very popular), and to indicate how familiar they were with the brand (endpoints of very unfamiliar and very familiar).

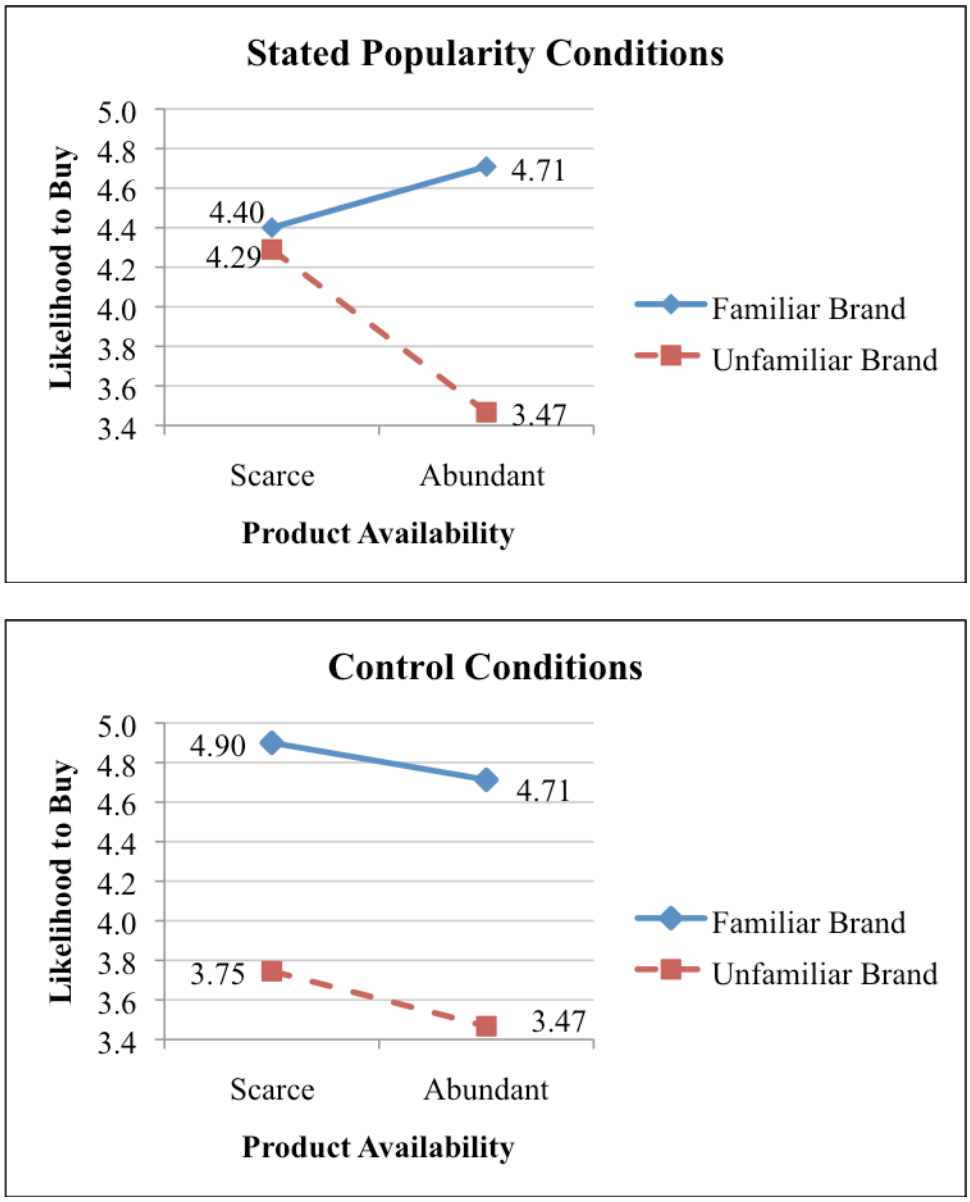
Results

Manipulation checks. Two manipulation checks confirmed that participants were more familiar with the familiar brands than the unfamiliar brands ($M_{\text{Familiar}} = 4.80$, $M_{\text{Unfamiliar}} = 2.11$; $F(1, 883) = 494.44$, $p < .001$) and that participants rated the products as more popular in the stated popularity conditions than in the control

conditions ($M_{\text{Stated Popularity}} = 5.12$, $M_{\text{Control}} = 4.76$; $F(1, 883) = 11.37$, $p < .01$).

Main analyses. A 2 (product availability: scarce, abundant) x 2 (popularity: stated, control) x 2 (brand familiarity: familiar, unfamiliar) ANOVA revealed a significant three-way interaction for likelihood to buy ($F(1, 877) = 4.32$, $p < .05$; see Figure 4) for the five product categories combined. A follow-up 2 (product availability) x 2 (brand familiarity) ANOVA for the stated popularity conditions revealed a significant brand familiarity main effect ($M_{\text{Familiar}} = 4.56$, $M_{\text{Unfamiliar}} = 3.88$; $F(1, 426) = 49.02$, $p < .001$) and brand familiarity by product availability interaction effect ($F(1, 426) = 10.51$, $p < .01$). The significant brand familiarity main effect suggests that participants were more likely to buy the product when the brand was familiar rather than unfamiliar. Planned contrasts for the interaction effect suggest that participants were more likely to buy the unfamiliar brand products when the products were scarce than when they were abundant ($M_{\text{Scarce}} = 4.29$, $M_{\text{Abundant}} = 3.47$; $F(1, 426) = 10.62$, $p < .01$). However, for the familiar brand products, no differences between the product availability conditions emerged ($M_{\text{Scarce}} = 4.40$, $M_{\text{Abundant}} = 4.71$, *NS*). These results provide support for H1a. A brand familiarity main effect emerged in a follow-up 2 (product availability) x 2 (brand familiarity) ANOVA for likelihood to buy in the control conditions ($M_{\text{Familiar}} = 4.81$, $M_{\text{Unfamiliar}} = 3.61$; $F(1, 451) = 43.87$, $p < .001$), suggesting that participants were more likely to buy the familiar brand over the unfamiliar brand; however, the product availability main effect and interaction effect were not significant. These results provide support for H1b.

FIGURE 4 - STUDY 1 RESULTS: THE EFFECTS OF PRODUCT SCARCITY, POPULARITY AND BRAND FAMILIARITY ON PURCHASE INTENTIONS FOR NONFOOD PRODUCTS



Additionally, I created an index for consumer attitudes toward the product, which included the responses for both measures (negative/positive, favorable/unfavorable) (a = .97), and conducted a 2 (brand familiarity) x 2 (product availability) ANOVA for the stated popularity conditions with the consumer attitudes index as the dependent variable. The findings for consumer attitudes were consistent with the findings for likelihood to buy.

Mediated moderation analysis. In order to test the underlying role of perceived quality (i.e., consumers' evaluations of the quality of the focal brand), I tested a mediated moderation model for the stated popularity conditions that addressed the intervening role of perceived quality in mediating the overall relationship between product availability, brand familiarity, and likelihood to buy. Mediated moderation involves showing an interaction effect of two factors on the dependent variable, then introducing a mediator of that effect (Baron and Kenny 1986; Preacher and Hayes 2004). In the stated popularity conditions, the interaction between product availability and brand familiarity affects likelihood to buy ($F(1, 426) = 10.51$, $p < .01$). The next step is to conduct a mediated moderation analysis to determine if perceived quality mediates the effects.

Following the generally accepted criteria set forth by Baron and Kenny (1986), a series of multiple regressions were conducted to show that (1) the interaction between product availability and brand familiarity is correlated to likelihood to buy, providing evidence for an overall relationship to be mediated, (2) that the interaction between product availability and brand familiarity is correlated with perceived quality, providing support for the relationship between

the predictor and the proposed mediator, and (3) that perceived quality has a unique effect on likelihood to buy when included with the interaction between product availability and brand familiarity as a predictor. For the stated popularity conditions, all of Baron and Kenny's (1986) criteria for mediation are established, providing evidence for the mediating role of perceived quality on the relationship between product availability, brand familiarity and likelihood to buy. While the Baron and Kenny (1986) procedure involves combining the results of several tests, the Sobel test directly addresses whether or not the total effect of the interaction between product availability and brand familiarity on likelihood to buy is significantly reduced when perceived quality is added to the model (Preacher and Hayes 2004). I conducted the Sobel test using the unstandardized regression coefficients and the standard errors for the association between the interaction of product availability and brand familiarity and perceived quality and the association between perceived quality and likelihood to buy when the interaction between product availability and brand familiarity was also included as a predictor (Sobel 1982). The results of the Sobel test support the findings of the Baron and Kenny (1986) procedure ($z = -5.17$, $p < .001$), indicating that perceived quality mediates the relationship between the interaction of product availability and brand familiarity on likelihood to buy. Additionally, the effect of the interaction between product availability and brand familiarity on likelihood to buy while controlling for perceived quality was not significant, suggesting that perceived quality fully mediates the relationship (Baron and Kenny 1986). These

findings provide empirical support for the mediating role of perceived quality on the relationship between product scarcity and likelihood to buy.

Discussion

Study 1 tested the effect of product scarcity due to popularity on consumers' attitudes toward and likelihood of buying nonfood products. For unfamiliar brand products, consumers' attitudes and likelihood of buying were significantly greater for products that are scarce due to popularity than for products that are abundant. However, for familiar brand products, no difference emerged between the product availability conditions, consistent with the explanation that if consumers already know about the product based on a previously learned cue (i.e., the brand) then they disregard other cues in the environment (i.e., the popularity of the brand). These findings provide support for H1a. Additionally, by testing H1a and H1b as a three-way interaction, I was able to tease out the effects of each of the three cues—popularity, product availability, and brand familiarity. While I find that stated popularity together with limited product availability signals that the product is scarce, the results suggest that scarcity alone is not enough to increase consumer preferences. In the control condition when the product scarcity was not attributed to popularity, no differences emerged between the product availability conditions for the familiar brands or the unfamiliar brands, providing support for H1b.

Research in the scarcity literature suggests that limited availability that is attributed to a market condition, such as popularity, should increase the desirability of a product (Verhallen 1982; Verhallen and Robben 1994). However, the focus of the majority of the research in this area has been on discretionary or specialty

products with some researchers suggesting that scarcity strategies are not likely to be effective for products that fulfill basic necessities or offer little differentiation (e.g., Stock and Balachander 2005). However, the results suggest that scarcity strategies can be effective for frequently purchased consumer products and that familiarity with the brand moderates the effect of product availability on consumers' likelihood of buying when scarcity is due to popularity. Furthermore, the results show that perceived quality underlies the positive effects observed for unfamiliar brands. These results are consistent with my explanation that when consumers are unfamiliar with the choice options, they make inferences regarding the quality of the products based on cues in the environment; however, consumers who are familiar with the choice options have preexisting attitudes and are not as influenced by the cues.

Chapter 4

Study 2 - The Effects Of Product Scarcity, Organization And Brand Familiarity On Purchase Intentions For Nonfood Products

In Study 1, I showed that when consumers are told that the product availability is due to popularity, the desirability of unfamiliar brand products increases when products are scarce. While in retail environments it is possible to include cues in the display that tell consumers about the popularity of a product (e.g., point-of-purchase signs), in Study 2, I seek to manipulate the reason for the scarcity through a cue that is more naturally occurring in the environment – the appearance of the products on the shelf. The purpose of this study is to establish that consumers draw inferences regarding the reason for the scarcity of a product based on cues available in the retail environment, and these inferences have an effect on their likelihood of buying the displayed products. As in Study 1, the focus of this study is on nonfood products and I test H1a and H1b.

Design and Procedure

Study 2 consisted of a 2 (product availability: scarce, abundant) x 2 (brand familiarity: familiar, unfamiliar) x 2 (organization: organized, disorganized) between subjects experimental design. Instead of telling participants that the product was the best-selling product in its category in the store (as in Study 1), popularity in Study 2 was manipulated by making the displays for the focal brand disorganized. Disorganization together with scarcity should signal that other consumers are interacting with and purchasing the products. The display for the other brand was always full and organized (see Figure 5).

FIGURE 5 – STIMULI FOR STUDY 2

Toothpaste

A: Scarce Product Availability, Disorganized, Unfamiliar Brand

Toothpaste

B: Abundant Product Availability, Organized, Familiar Brand

Five hundred participants, who participated in the study in exchange for extra credit in an undergraduate marketing course, were randomly assigned to one of the eight experimental conditions and given a photograph booklet that contained photographs for four product categories—toothpaste, fabric softener, dishwashing liquid, and shampoo. As an example, participants were asked, on seven-point scales, how likely they would be to buy a bottle of Dawn dishwashing liquid from the shelf in the picture, and to rate the quality and popularity of the Dawn dishwashing liquid on the shelf in the picture.

Results

Pre-test. A pre-test confirmed that disorganized displays were rated as significantly less organized than organized displays ($M_{Organized} = 5.82$; $M_{Disorganized} = 3.46$; $t(968) = 27.18$, $p < .01$).

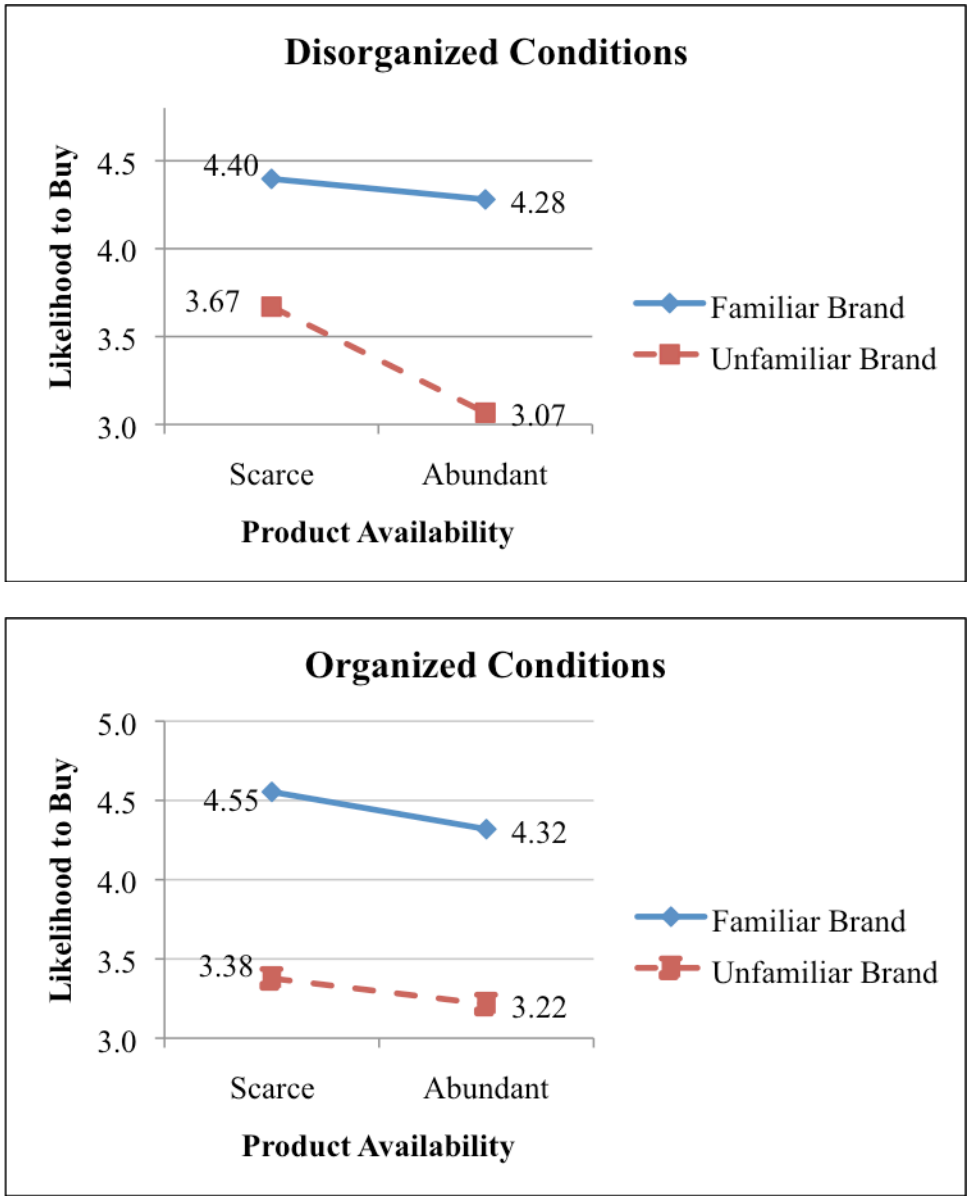
Popularity ratings. In order to determine whether consumers inferred that the product was popular based on product availability and the organization of the display, I conducted a 2 (product availability: scarce, abundant) x 2 (brand familiarity: familiar, unfamiliar) ANOVA with perceived popularity as the dependent variable for the disorganized conditions. The analysis revealed a significant product availability main effect ($M_{Scarce} = 5.52$, $M_{Abundant} = 4.73$; $F(1, 996) = 140.02$, $p < .001$), suggesting that scarce products were perceived to be more popular than products that were abundant, a significant brand familiarity main effect ($M_{Familiar} = 5.66$, $M_{Unfamiliar} = 4.58$; $F(1, 996) = 75.23$, $p < .001$), suggesting that familiar brand products were perceived to be more popular than unfamiliar brand products, and a significant product availability by brand familiarity interaction effect

($F(1, 996) = 10.09$, $p < .01$). Planned contrasts revealed that for both the familiar brand and unfamiliar brand conditions, participants inferred that the scarce products were more popular than the abundant products (familiar brand conditions: $M_{Scarce} = 5.91$, $M_{Abundant} = 5.41$; $F(1, 996) = 12.68$, $p < .001$; unfamiliar brand conditions: $M_{Scarce} = 5.12$, $M_{Abundant} = 4.04$; $F(1, 996) = 86.90$, $p < .001$). Perceived popularity did not change across product availability conditions for the organized conditions.

Main analyses. A 2 (product availability: scarce, abundant) x 2 (brand familiarity: familiar, unfamiliar) x 2 (organization: disorganized, organized) ANOVA revealed a marginally significant three-way interaction effect for likelihood to buy for the four product categories combined ($F(1, 1980) = 2.73$, $p < .10$; see Figure 6). A 2 (product availability) x 2 (brand familiarity) ANOVA for the disorganized conditions revealed a significant product availability main effect ($M_{Scarce} = 4.04$, $M_{Abundant} = 3.67$; $F(1, 996) = 61.86$, $p < .01$), a significant brand familiarity main effect ($M_{Familiar} = 4.34$, $M_{Unfamiliar} = 3.38$; $F(1, 996) = 9.05$, $p < .01$), and a significant two-way interaction ($F(1, 996) = 4.21$, $p < .05$) for likelihood to buy, providing support for H1a. Planned contrasts for the interaction effect suggest that participants were more likely to buy the unfamiliar brand nonfood products when the products were scarce than when they were abundant ($M_{Scarce} = 3.67$, $M_{Abundant} = 3.07$; $F(1, 996) = 15.85$, $p < .01$). However, for the familiar brand nonfood products, no difference emerged between the product availability conditions ($M_{Scarce} = 4.40$, $M_{Abundant} = 4.28$, *NS*). A follow up 2 (brand familiarity) x 2 (product availability) ANOVA for the organized conditions revealed a significant brand familiarity main effect ($M_{Familiar} = 4.44$, $M_{Unfamiliar} = 3.30$; $F(1, 984) = 84.37$, $p <$

.001); however, the product availability main effect and the interaction effect were not significant, providing support for H1b.

FIGURE 6 - STUDY 2 RESULTS: THE EFFECTS OF PRODUCT SCARCITY, ORGANIZATION AND BRAND FAMILIARITY ON PURCHASE INTENTIONS FOR NONFOOD PRODUCTS



Mediated moderation analysis. Following the same procedure as in Study 1, I conducted a mediated moderation analysis to test the underlying role of perceived quality in mediating the relationship between product availability, brand familiarity and likelihood to buy for the disorganized conditions. The analysis produced a significant effect ($z = -7.85$, $p < .001$), suggesting that perceived quality mediates the relationship (Baron and Kenny 1986; Sobel 1982).

Discussion

The results of Study 2 suggest that consumers draw inferences regarding the cause of the product scarcity based solely on cues that are naturally occurring in retail environments, and these inferences affect their preferences for the displayed products. The results of this study are also consistent with the results in Study 1. In the disorganized conditions, the results are consistent with the results for the stated popularity conditions in Study 1. Consumers' likelihood of buying the unfamiliar brand products was greater when the products were scarce rather than abundant when scarcity was due to popularity. However, no differences in likelihood to buy emerged when the brands were familiar, even though participants rated scarce products as being more popular than abundant products. These results provide additional support for H1a. Additionally, perceived quality was again shown to be the underlying mechanism for the effects. Furthermore, the results in the organized conditions are consistent with the results in the control conditions in Study 1, providing support for H1b. When consumers do not infer

that scarcity is due to popularity, preferences do not differ based on product availability.

Chapter 5

Study 3 - The Effects Of Product Scarcity, Organization And Brand Familiarity On Purchase Intentions For Food Products

In Study 1 and Study 2, I show that scarcity effects emerge for unfamiliar brand nonfood products when consumers attribute the scarcity to popularity, while no effects emerge for familiar brand nonfood products. The purpose of Study 3 is to determine how these effects will differ when the type of product is a consumable product. In retail environments, consumers draw inferences regarding the cause for product availability and, in the case of food products, the interactions that the displayed products have had with previous customers. While only perceived contact is necessary for negative contamination effects to emerge, in this study, I visually manipulate the cause of the product scarcity by altering the appearance of the display (as in Study 2). I propose that disorganized product displays will serve as a cue to consumers that the products are scarce due to popularity (as shown in Study 2) and have been handled by others. For unfamiliar brand food products, while feelings of disgust may emerge, so may consumers' informational needs leading to quality inferences; both of these responses will mitigate each other and no differences should emerge between the product availability conditions.

However, for familiar brand food products, consumer preferences should be lower when products are scarce rather than abundant when the scarcity is due to popularity. For familiar brand food products, I proposed that product availability would play a key role in determining the extent to which negative

contamination effects will arise. When a display is full, the contamination is spread over multiple products, lessening the effect of contamination. However, when the display only contains one product, all of the contamination is concentrated on that product, leading to a stronger effect.

When the product displays are organized, there are no cues to signal that the products are scarce due to popularity (consistent with findings in the control conditions in Study 1 and the organized conditions in Study 2) or that they have been handled; therefore, in the organized conditions, no differences should emerge between the product availability conditions across brand familiarity conditions.

First, I conducted a pre-test to provide empirical support for the role of scarcity in strengthening the negative effects elicited by the inference that the products have been contaminated, by showing that participants perceive that scarce products in disorganized displays have been touched by more customers than products that are abundantly available.

Pre-Test

Design and procedure. The pre-test consisted of a 2 cell (product availability: scarce, abundant) between subjects experimental design with disorganization held constant. Participants were 34 undergraduate marketing students who were awarded extra credit in a marketing course for their participation. Participants were randomly assigned to one of two experimental conditions and were given a photograph booklet that contained photographs for three product categories: juice, yogurt and popcorn. Participants were asked, for example, "How many people

have touched the (one of the) box(es) of Orville Redenbacher's popcorn on the shelf in the picture?" and asked to provide a number.

Results. A one-way ANOVA (product availability: scarce, abundant) demonstrated a significant effect for product availability on how many people had touched the product ($F(1, 100) = 26.14$, $p < .001$; $M_{Scarce} = 7.18$, $M_{Abundant} = 1.68$), with participants stating that the scarce product had been touched by significantly more people than one of the products in the abundant product availability condition.

Discussion. The results of the pre-test provide empirical support for the proposed explanation that when a product is abundantly available, the strength of the contamination decreases because it is not concentrated on a single product. Participants believed that the scarce product had been touched by more consumers than one of the products in the display that contained multiple products. Therefore, in the case of food products, consumers believed that the abundant products were less contaminated than the scarce ones.

Main Study

Design and procedure. Study 3 consisted of a 2 (brand familiarity: familiar, unfamiliar) x 2 (product availability: scarce, abundant) x 2 (organization: organized, disorganized) between subjects experimental design. I tested the same products as in the pre-test (i.e., juice, yogurt and popcorn), which included both perishable food products and nonperishable food products, in order to determine whether participants' responses to the two types of packaged food products differed, given the possibility that freshness concerns could be associated with perishable packaged food products, especially when the products are scarce. For

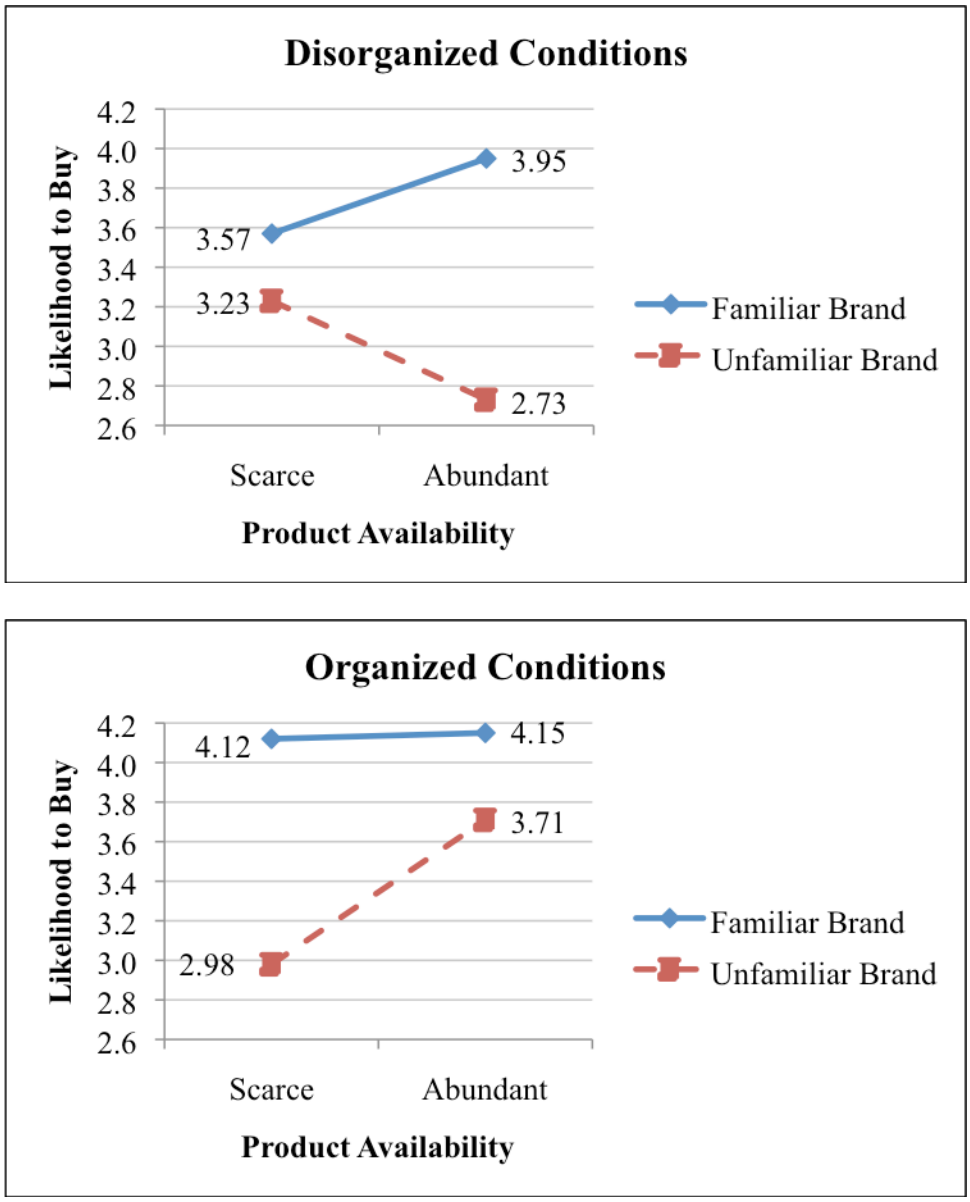
instance, a consumer could worry that a single package of yogurt on a shelf could indicate that the yogurt had previously been left out somewhere in the store and had thus spoiled.

Participants were 303 undergraduate marketing students who were awarded extra credit in an introductory marketing course for their participation. Each participant was randomly assigned to one of eight conditions and asked to follow the same procedure as in previous studies. Brand familiarity, product availability and organization were manipulated in the same way as in Study 2. Participants were asked, for example, "How likely are you to buy a box of Orville Redenbacher's popcorn from the shelf in the picture?" Participants responded on a seven-point scale with endpoints of "not at all likely" and "very likely." They were then asked, "How would you rate the quality of the Orville Redenbacher's popcorn on the shelf in the picture?" Responses were measured on a seven-point scale with endpoints of "very low" and "very high." Participants were then given the following instructions, "As you look at the picture as if you were at the store standing in front of the shelf, please indicate the extent to which you feel each of the following by circling the appropriate number," and asked to complete a 20-item affect scale which included positive, negative, and disgust measures measured on 10-point scales.

Pre-test. A pre-test confirmed that products on disorganized displays were more likely to have been touched by others than products on organized displays when product availability was scarce ($M_{Organized} = 5.08$; $M_{Disorganized} = 5.79$; $F(1, 276) = 15.07$, $p < .001$) and abundant ($M_{Organized} = 4.57$; $M_{Disorganized} = 6.32$; $F(1, 274) = 85.58$, $p < .001$).

Main analyses. Significant differences did not emerge between the perishable and nonperishable food products, as expected; therefore, perishable and nonperishable food products were combined in the analyses. A 2 (product availability: scarce, abundant) x 2 (organization: disorganized, organized) x 2 (brand familiarity: familiar, unfamiliar) ANOVA demonstrated a significant three-way interaction for likelihood to buy ($F(1, 901) = 6.36$, $p < .05$; see Figure 7). The effect of product availability on likelihood to buy is moderated by brand familiarity and organization. When the display was disorganized, the brand familiarity main effect ($F(1, 449) = 12.89$, $p < .001$; $M_{\text{Familiar}} = 3.76$, $M_{\text{Unfamiliar}} = 2.98$) and the two-way interaction between product availability and brand familiarity were significant ($F(1, 449) = 4.15$, $p < .05$). Consumers were more likely to buy familiar brand food products when the products were abundant than when they were scarce ($M_{\text{Scarce}} = 3.57$, $M_{\text{Abundant}} = 3.95$; $F(1, 449) = 3.58$, $p = .05$). For unfamiliar brand food products, no difference in likelihood to buy emerged between the two product availability conditions ($M_{\text{Scarce}} = 3.23$, $M_{\text{Abundant}} = 2.73$, *NS*). These results provide support for H2. When the display was organized, a significant brand familiarity main effect emerged ($F(1, 452) = 2.37$, $p < .001$; $M_{\text{Familiar}} = 4.13$, $M_{\text{Unfamiliar}} = 3.34$); however, the two-way interaction between product availability and brand familiarity was not significant, suggesting that product scarcity alone is not enough to elicit negative contamination effects and providing support for H1b.

FIGURE 7 - STUDY 3 RESULTS: THE EFFECTS OF PRODUCT SCARCITY, ORGANIZATION AND BRAND FAMILIARITY ON PURCHASE INTENTIONS FOR FOOD PRODUCTS



Mediation analysis. In order to test the underlying role of feelings of disgust in driving the negative effects observed for food products, I tested a mediation model that addressed the intervening role of feelings of disgust in mediating the relationship between organization and likelihood to buy. Following the generally accepted criteria set forth by Baron and Kenny (1986), I conducted a mediation analysis and calculated the Sobel z-value to determine whether the proposed mediation was significant. The analysis produced a significant effect ($z = -2.16$, $p < .05$), suggesting that feelings of disgust mediate the relationship (Baron and Kenny 1986; Sobel 1982).

Discussion. The results of Study 3 provide support for H2 by showing that for familiar brand food products, product availability that is attributed to popularity can lead to the reverse of scarcity effects, with consumer preferences for scarce products being lower than for abundant products. However, no differences emerged for unfamiliar brand food products across product availability conditions. Additionally, the results provide additional support for H1b; when scarcity is not attributed to popularity (i.e., the display was organized), differences in purchase intentions did not emerge between the product availability conditions for food products across brand familiarity conditions. By testing the effects of product availability due to popularity on likelihood to buy using three-way analysis that independently manipulated product availability, organization and brand familiarity, I was able to tease out the effects of product availability and consumers' inferences about the reason for the scarcity to determine that product scarcity alone does not negatively affect consumer preferences, but it

does strengthen contamination effects when consumers infer that contamination has occurred. Additionally, the results suggest that feelings of disgust underlie the negative effects. Finally, by including both perishable and nonperishable food products, I was able to rule out perishability and freshness concerns as the drivers of the negative effects observed, given that differences did not emerge between perishable and nonperishable packaged food products.

Chapter 6

Study 4 - The Effects Of Product Scarcity And Pricing On Purchase Intentions For Familiar Brand Products

Study 3 provided empirical support for H2 by showing that consumers' likelihood of buying familiar brand food products is lower when products are scarce than when they are abundant. I designed Study 4 to fulfill three objectives. The first objective is to provide additional support for consumer inferences regarding product availability due to popularity by manipulating a different set of cues in the retail environment (i.e., pricing and the availability of a competing product instead of organization) and allowing consumers to infer that the products are scarce due to popularity. The second objective is to provide additional support for H2 and the negative effects of contamination and product availability on the likelihood of buying familiar brand food products but not familiar brand nonfood products. Finally, the third objective is to show that consumers can overcome the negative effects of feelings of disgust when a stronger motivator is present (i.e., a price promotion) by showing that consumers perceive that others have touched the products but their likelihood of buying scarce familiar brand food products is not negatively affected when the products are on sale (H3). The focus of this study is on familiar brand products only.

Design and Procedure

In the studies up to this point, pricing information was not provided. In this study, I add information on prices and expect it to influence consumer inferences about why products are scarce. In particular, if two brands in one

product category are displayed with the same price, and yet there are fewer products for one of the brands than the other on the shelf, then consumers may infer that the first brand is more popular than the second (since it has apparently sold more units even though it has the same price as a competitor). Pre-test results confirmed that scarce products were considered to be more popular and more likely to have been touched by others when pricing information was provided for both the focal brand and the competing brand than when pricing information was not provided across product type conditions (perceived popularity: $F(1, 82) = 7.01$, $p < .05$; $M_{\text{Price Information}} = 6.23$, $M_{\text{No Price Information}} = 5.54$; likelihood that others touched: $F(1, 358) = 5.47$, $p < .05$; $M_{\text{Price Information}} = 5.22$, $M_{\text{No Price Information}} = 4.81$).

I propose that when focal brand products are scarce and regular price, consumers will infer that the focal brand products are scarce due to popularity, given that the competing brand is equally priced and abundant (i.e., not being chosen by consumers). Therefore, consumers should be less likely to buy food products when the products are scarce rather than abundant (as in the first half of H2, which focuses on familiar brand food products, as I only test familiar brand products in Study 4). This effect should be consistent with the findings of Study 3 (when popularity was inferred through a different set of cues - disorganized shelves). Similarly, when the focal brand products are scarce and on sale, consumers should again infer that the focal brand products are scarce due to popularity driven by the price promotion; yet, consumer preference for the scarce food products now should not be negatively affected as the likelihood of buying

food products should not differ across product availability conditions, given that feelings of disgust should now be overcome in favor of the price promotion. In addition, consistent with the findings of Study 1 and Study 2, I do not expect any differences to emerge for nonfood products across product availability conditions or price conditions, given that I am only testing familiar brand products and quality inferences should not be influenced as easily when preexisting attitudes about the brands exist.

Study 4 followed the same procedure as Study 3, with two major changes: the displays were organized for both the focal brand and the competing brand, in both price conditions (i.e., regular price condition and sale price condition) and prices were associated with each of the two brands displayed in each photograph for each product category. Study 4 was a 2 (product availability: scarce, abundant) x 2 (price: regular, sale) x 2 (product type: food – juice, yogurt, nonfood – toilet paper, dishwashing soap) experimental design. Price was manipulated by associating prices with the two brands displayed in the photograph for each product category. In the regular price conditions, both the focal brand and the competing brand were equally priced (e.g., $3.89 appeared under both Dawn dishwashing liquid and Palmolive dishwashing liquid). In the sale price conditions, both the focal brand and the competing brand were equally priced but the words "sale price" appeared under the price for the focal brand (see Figure 8). Prices for each product category were chosen based on the average price of the products available for each product category at a local supermarket at the time the study was conducted.

FIGURE 8 – STIMULI FOR STUDY 4

DISHWASHING LIQUID

$3.89 $3.89

A: Scarce Product Availability, Regular Price, Nonfood Product

POPCORN

$3.09 $3.09

SALE PRICE

B: Abundant Product Availability, Sale Price, Food Product

Three hundred and forty six undergraduate students participated in the study in exchange for extra credit in an introductory marketing course. Participants were asked about their purchase likelihood and impressions that the products had been touched. For instance, they were asked, "how likely are you to buy a package of Light & Fit yogurt from the shelf in the picture?" and "how likely is it that other people have touched a package of Light & Fit yogurt on the shelf in the picture?" Responses for both questions were measured on seven-point scales with endpoints of "not at all likely" and "very likely."

Results

Contamination effects. In order to show that consumers perceived that products in both price conditions were contaminated, I conducted two 2 (product availability: scarce, abundant) x 2 (product type: food, nonfood) ANOVAs, one for the regular price conditions and one for the sale price conditions, with likelihood that others had touched the products as the dependent variable. For both price conditions, significant main effects of product availability (regular price conditions: $F(1, 342) = 40.93$, $p < .001$; sale price conditions: $F(1, 342) = 78.17$, $p < .001$) and interaction effects emerged (regular price conditions: $F(1, 342) = 3.79$, $p = .05$; sale price conditions: $F(1, 342) = 14.16$, $p < .001$). In both price conditions, participants believed that scarce products were more likely to have been touched by others than abundant products (regular price conditions: $M_{\text{Scarce}} = 5.22$, $M_{\text{Abundant}} = 4.02$; sale price conditions: $M_{\text{Scarce}} = 5.54$, $M_{\text{Abundant}} = 4.04$). Additionally, the significant interaction effects suggest that for both price conditions (i.e., regular price and sale price) and for both product types (i.e., food

and nonfood products) participants believed that scarce products were more likely to have been touched by others than abundant products (regular price conditions – food products: $F(1, 342) = 10.09$, $p = .01$, $M_{Abundant} = 4.37$, $M_{Scarce} = 5.21$; nonfood products: $F(1, 342) = 34.21$, $p = .001$, $M_{Abundant} = 3.66$, $M_{Scarce} = 5.23$; sale price conditions - food products: $F(1, 330) = 30.92$, $p = .001$, $M_{Abundant} = 4.39$, $M_{Scarce} = 5.26$; nonfood products: $F(1, 330) = 79.92$, $p = .001$, $M_{Abundant} = 3.68$, $M_{Scarce} = 5.82$).

Main analyses. A 2 (price: regular, sale) x 2 (product availability: scarce, abundant) x 2 (product type: food, nonfood) ANOVA revealed a significant three-way interaction for likelihood to buy ($F(1,671) = 5.47$, $p < .05$; see Figure 9). The effect of product availability and product type on likelihood to buy is different depending on the price condition. A 2 (product availability) x 2 (product type) ANOVA for the regular price conditions revealed a significant two-way interaction for likelihood to buy ($F(1, 342) = 4.42$, $p < .05$). For food products, I found a marginally significant difference between the abundant and scarce product availability conditions, for regular prices ($M_{Abundant} = 4.00$, $M_{Scarce} = 3.51$; $F(1, 342) = 2.92$, $p < .10$). This suggests that consumer preferences for familiar brand food products were lower when the products were scarce rather than abundant (providing support for the first half of H2, which focuses on familiar brand products, since I only examined familiar brand products in Study 4). I also found that there was no significant difference in purchase intent for nonfood products across product availability conditions ($M_{Abundant} = 4.39$, $M_{Scarce} = 4.76$;

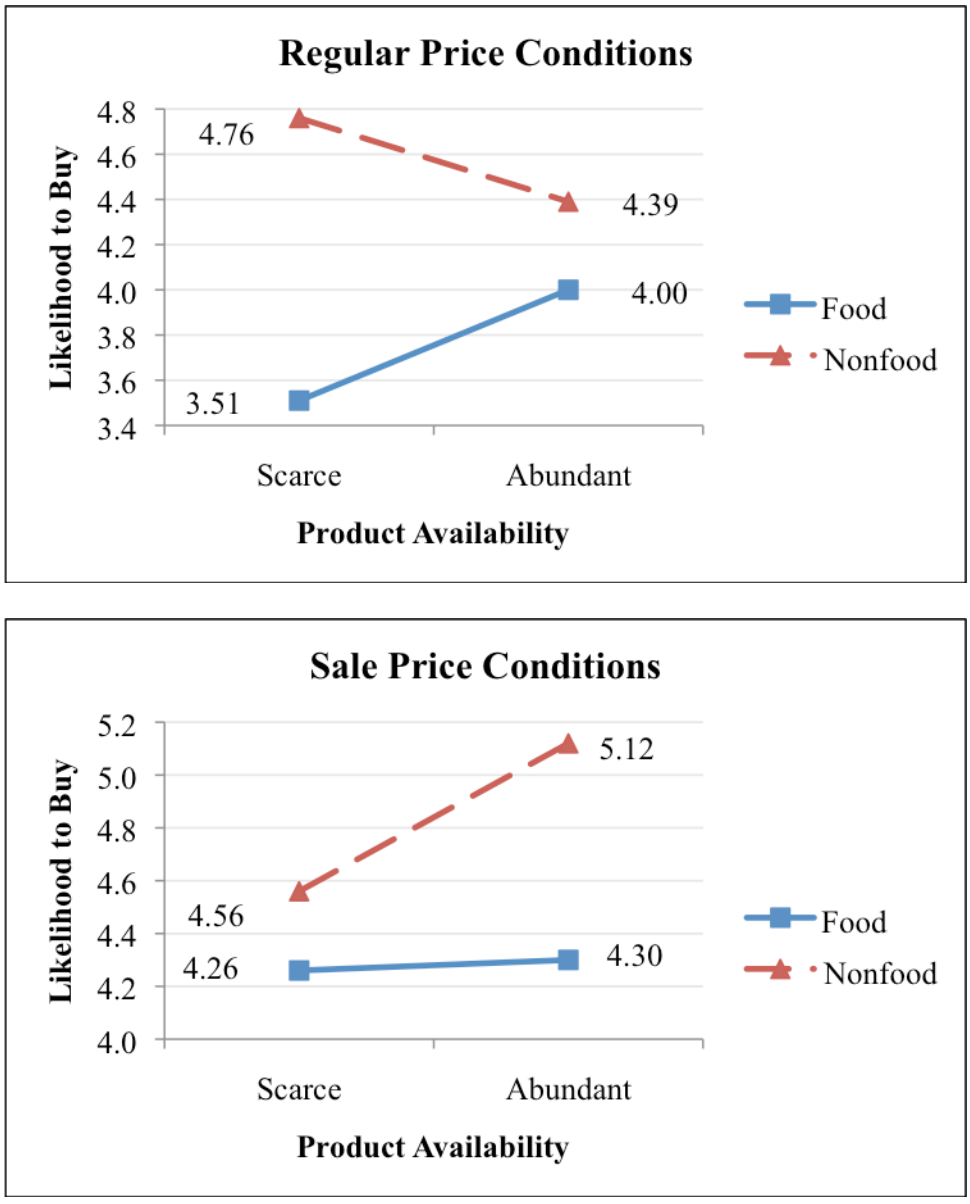
NS), (providing support for the second half of H1a, which focuses on familiar (nonfood) brand products).

In addition, in the sale price conditions, there was no longer a reduction in purchase intentions for the food products when they were scarce instead of abundant ($M_{\text{Abundant}} = 4.30$, $M_{\text{Scarce}} = 4.26$; *NS*). Furthermore, there was a significant increase in purchase intentions for food products, in the scarce conditions, when they were offered with a price promotion rather than at regular price ($M_{\text{Sale Price}} = 4.26$, $M_{\text{Regular Price}} = 3.51$; $F(1, 167) = 3.66$, $p < .05$). This provides support for H3.

Discussion

Study 4 provides support for H2 by using additional cues in the environment (i.e., product availability and pricing) to signal that product scarcity was attributed to popularity, whereas earlier studies used a different set of cues (Figure 2). In particular, consumer preferences for (familiar brand) food products when other consumers were choosing the focal brand over the competing brand, even though both brands displayed the same price (i.e., regular price conditions), were lower when product availability was scarce than when it was abundant, consistent with the findings of Study 3 (in the disorganized conditions).

FIGURE 9 - STUDY 4 RESULTS: THE EFFECTS OF PRODUCT SCARCITY AND PRICING ON PURCHASE INTENTIONS FOR FAMILIAR BRAND PRODUCTS



More importantly, the results provide support for H3. The results suggest that in both price conditions (regular and sale), consumers believed that scarce products were more likely to have been touched by others than abundant products. While contamination had a negative effect on consumer preferences for packaged food products in the regular price conditions, it did not have such an effect in the sale price conditions. Therefore, the price promotion mitigated the negative effects of contamination and scarcity. To my knowledge, this is the first study to provide empirical support for people's ability to overcome feelings of disgust.

The negative contamination effects that emerged for scarce food products in the regular price conditions rule out an alternative explanation that could have explained the negative effects that emerged for scarce food products in the disorganized conditions in Study 3. In Study 3, consumers may have inferred that due to the handling of the product, the scarce food products may have been damaged in some way. However, I found the same effects in the regular price conditions in Study 4, where the products showed no actual signs of being touched (or, potentially damaged).

Chapter 7

Transfer Of Product Impressions To Store Impressions

As demonstrated by the results of the studies that have been presented thus far, environmental cues play an important role in influencing consumer preferences. The results suggest that the appearance of the display can be used as a cue for consumers to determine whether the products are popular and can affect consumer preferences for the displayed products negatively or positively, depending on the familiarity of the product and the type of product being displayed. However, it is not clear whether the negative effects that emerged for familiar brand food products (in Study 3 and Study 4) will impact consumer evaluations of other factors, such as the store itself.

It is unpleasant for people to have disgusting objects in their immediate surroundings (Angyal 1941). Previous research suggests that feelings of disgust can have a lingering effect and can affect decisions that are made after the disgust is elicited (Angyal 1941; Lerner, Small, and Lowenstein 2004). In the retail environment, consumers may feel disgusted when other people touch the products they want to buy and they may view touched products as having been negatively contaminated, leading to a decrease in their evaluations of those products. I propose that these negative reactions will transfer to consumers' evaluations of the store environment by reflecting their evaluations of the contaminated products onto their evaluations of the store.

In particular, I found in prior studies that concerns over contamination were likely for familiar brand food products that were available on disorganized

shelves, and as a result, purchase likelihood was lower for familiar brand food products that were scarce (and disorganized) than abundant (and disorganized). On the other hand, I found that product availability had less of an effect on familiar brand nonfood products, when these products were disorganized. If consumers transfer these impressions of the product to the store, then I would expect that, when products are disorganized, store impressions would be more negative when familiar brand food products are scarce rather than abundant, but should be less affected when the displayed products are nonfood products.

I next consider what might happen when the products on the shelf are organized. Prior research on how organization influences consumer evaluations is limited and suggests that consumers may reward firms that exert extra effort in displaying their products in an organized manner (Morales 2005). Therefore, consistent with previous findings in the literature, when a contamination cue (disorganized shelves) is not present, I expect that consumers will have more positive evaluations of the store when product availability is abundant (shelves are fully stocked) for both packaged food products and nonfood products, since it may show a higher level of effort from the firm. As a result, I expect that when shelves are organized (no contamination cue is present), consumers will take abundant product availability as a signal of effort by the retailer, and have a more positive view of the retailer.

Chapter 8

Study 5 - Transfer Of Product Impressions To Store Impressions

Study 5 was designed to determine whether impressions of a product due to the interaction between shelf display cues and product attributes will transfer to impressions of the store that carries that product. I propose that negative contamination effects elicited by a contaminated product will transfer to the store environment, reducing consumers' evaluations of the store when familiar brand food products are scarce. However, given that negative contamination effects do not emerge for nonfood products, no difference between the product availability conditions should emerge. When products are organized, however, I expect that evaluations of the store will be higher when shelves are fully stocked than when products are scarce across product types. The focus of this study is on familiar brand products.

Design and Procedure

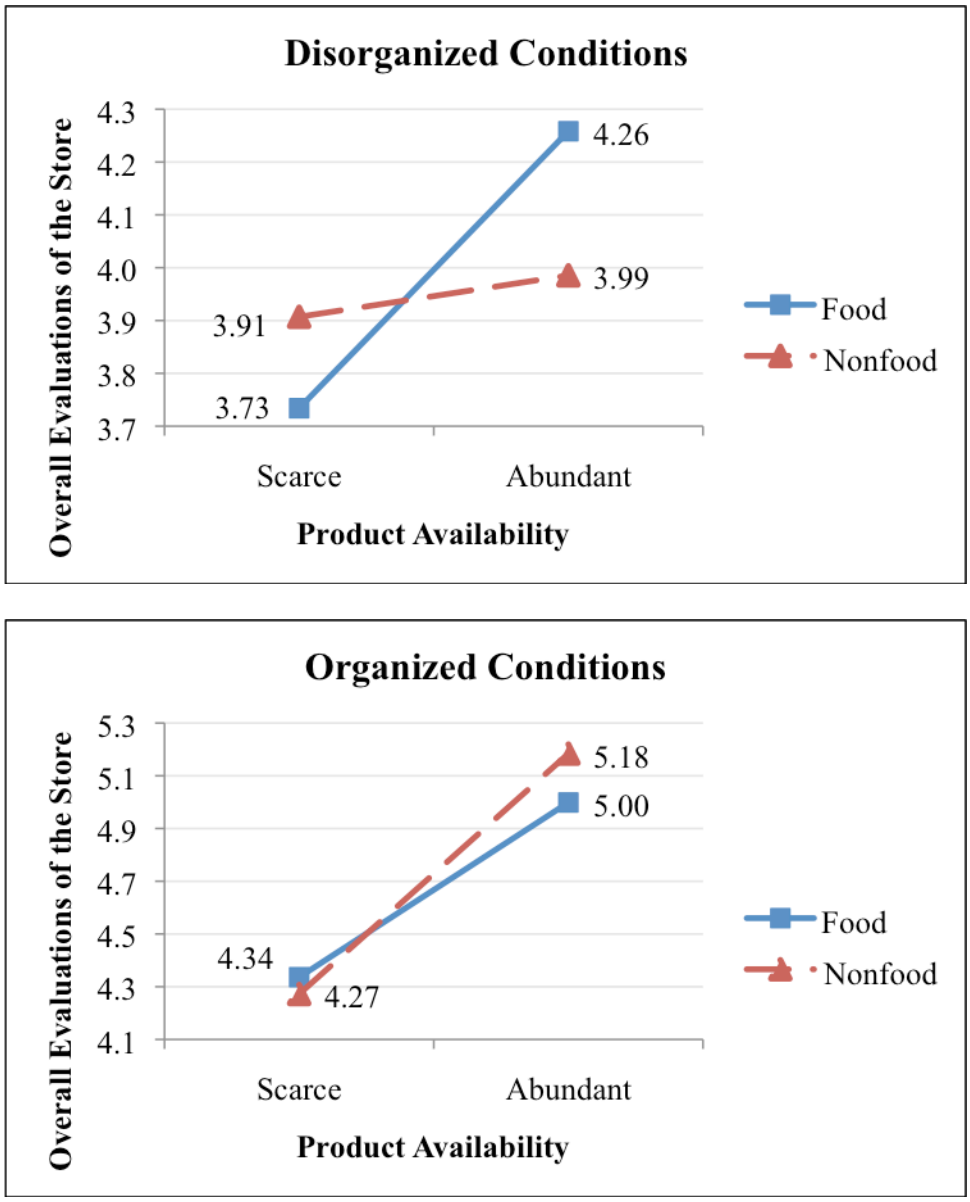
Study 5 consisted of a 2 (product availability: scarce, abundant) x 2 (organization: disorganized, organized) x 2 (product type: food – juice, popcorn, yogurt, nonfood – toilet paper, dishwashing soap) experimental design. Product availability and organization were manipulated between subjects and product type was manipulated within subjects. The stimuli and procedure were the same as in previous studies. Three hundred and sixty undergraduate marketing students participated in the study in exchange for extra credit in an introductory marketing course. Participants were randomly assigned to one of four experimental conditions. Participants were asked to rate their overall evaluations of the store

where the photographs were taken on seven-point scales with endpoints of bad/good, negative/positive, unfavorable/favorable, and dislike/like.

Results

A 2 (product availability: scarce, abundant) x 2 (organization: organized, disorganized) x 2 (product type: food, nonfood) ANOVA with an index for overall evaluations of the store ($\alpha = .96$) as the dependent variable revealed a significant three-way interaction ($F(1, 1177) = 5.36$, $p < .05$; see Figure 10), suggesting that the effect of product availability on overall evaluations of the store is moderated by organization and product type. When the displays were organized, the main effect of product availability was significant ($M_{\text{Abundant}} = 5.09$, $M_{\text{Scarce}} = 4.30$; $F(1, 587) = 57.63$, $p < .001$), suggesting that consumers' overall evaluations of the store are significantly more positive across food and nonfood products when the products are abundant rather than scarce, as expected. When the displays were disorganized, the two-way interaction between product availability and product type for overall evaluations of the store was significant ($F(1, 590) = 4.22$, $p < .05$), as expected. For food products, when the display was disorganized, consumers' overall evaluations of the store were significantly more positive when the products were abundant than when they were scarce ($M_{\text{Abundant}} = 4.26$, $M_{\text{Scarce}} = 3.73$; $F(1, 590) = 14.40$, $p < .001$). However, no significant difference emerged between the product availability conditions for nonfood products ($M_{\text{Abundant}} = 3.99$, $M_{\text{Scarce}} = 3.91$, *NS*).

FIGURE 10 - STUDY 5 RESULTS: TRANSFER OF PRODUCT IMPRESSIONS TO STORE IMPRESSIONS



Discussion

The results provide support for the notion that product availability and organization can have an effect on consumer evaluations of the retail environment. When the displays were organized, consumer evaluations of the store were more positive when products were abundant than when they were scarce. When the displays were disorganized, consumer evaluations of the store were more positive when the food products were abundant rather than scarce; however, no difference emerged for nonfood products, as expected. These results suggest that negative effects that emerge at the display level can negatively impact consumer evaluations of the environment. More importantly, consumers may transfer their negative reactions from the contaminated products to other factors, which can have an effect not just on evaluations of the overall environment but on consumers' evaluations of products encountered after the negative contamination effects emerge.

Chapter 9

General Discussion

The research examines how cues that are naturally occurring in the retail environment can signal that products are scarce, resulting in changes in product preference. The current research focuses on developing a theoretical model of how scarcity operates in the retail environment and provides different explanations and processes for why scarcity may either result in increased or decreased purchase intent. In a series of studies, I show that consumers draw inferences regarding other consumers' behavior based on display cues, such as display organization, product availability, and price, and why these inferences can lead to positive or negative effects depending on the type of product being displayed, and the familiarity of the brands. The results contribute to the literature by showing how cues in the retail environment interact to influence perceptions of why products are scarce, which then influence purchase intentions.

Across multiple studies, I find that consumer preferences for scarce nonfood products due to popularity are more positive than preferences for products that are abundantly available when consumers are unfamiliar with the brand options. The research indicates that rather than the nature of the product (e.g., discretionary) or consumption setting (e.g., public or private), it is consumers' familiarity with the choices that must be considered.

The research introduces familiarity as a key moderator in understanding when scarcity effects will and will not emerge and explains under what conditions consumers will draw inferences that will lead to scarcity effects or scarcity effect

reversals. While previous research has focused on the value-enhancing role of scarcity due to uniqueness and assumed expensiveness (e.g., Brock 1968; Lynn 1989; Lynn 1991; Snyder and Fromkin 1980), my research demonstrates that what underlies scarcity effects may be a need for information that leads consumers to draw quality inferences. Thus, I show that scarcity due to popularity increases consumer preferences for the products through perceived quality. When consumers are unsure of the options, based on the product display, they infer that products that are scarce due to popularity may be of higher quality than other products. While prior research has begun to address scarcity's role in eliciting quality inferences (e.g., Herpen, Pieters and Zeelenberg 2009; Stock and Balachander 2005), my research contributes to the literature above and beyond previous investigations by showing that consumers' need for information may determine whether or not they will make quality inferences that will affect their purchase intentions; therefore, scarcity may only elicit quality inferences under certain circumstances.

Additionally, prior literature suggests that scarcity strategies may not apply to commonly purchased products such as consumer packaged goods (Stock and Balachander 2005), and most scarcity research has looked at exclusive luxury products for which quality is ambiguous (e.g., wine), making it difficult to disentangle whether scarcity influences quality apart from perceptions of luxury and prestige (e.g., Herpen, Pieters, and Zeelenberg 2009). By using commonly purchased consumer goods, I was able to isolate scarcity's effect on quality without potential confounds caused by increased luxury and prestige. My

research shows that scarcity serves as a quality cue that may be universally applicable and not context or product specific, given that the evaluations of quality may be influenced solely by scarcity and driven by informational needs. Therefore, my research provides an explanation for the underlying process through which scarcity influences consumers' perceptions of value.

Additionally, my research contributes to the scarcity literature by empirically demonstrating that consumer responses to scarcity may differ depending on the type of product being displayed (i.e., food or nonfood). Thus, consumer inferences about scarce products may not only depend on the familiarity of the brands, but also on the consumers' level of intimacy with the products. These results underscore the importance of understanding the inferences that consumers draw based on the information available in the product displays. My research also examined the conditions under which a product display that signals that a product is scarce can lead to lower purchase intent. My results demonstrate that for familiar brand food products, consumers may draw inferences regarding the number of people who have come in contact with the products; this contamination concern together with product scarcity may then lead to reduced purchase interest. This result is consistent across two studies in the presence (i.e., in Study 3, manipulated through organization) and absence (i.e., in Study 4, manipulated through price) of physical evidence that contamination has occurred, suggesting that consumers do not have to be exposed to physical cues that others have touched the products in order for contamination effects to arise.

Therefore, my research contributes to the literature by showing when scarcity can have harmful effects and why this may occur.

The results also make a number of contributions over what has already been found in the literature (e.g., Argo, Dahl, and Morales 2006). I find that contamination alone is not enough to elicit negative contamination effects for familiar brand food products. In order for negative contamination effects to emerge, contamination and product availability must be considered together. Thus, scarcity alone may not be enough to signal that consumer contamination has occurred; rather, consumers need to infer that contamination has occurred for negative effects to emerge. Scarcity thus strengthens the salience of the contamination.

This research provides empirical support for the notion that when products are abundantly available, consumers infer that the contamination has been spread over all of the products; therefore, consumers infer that a product from a contaminated full display has been touched by fewer consumers than a scarce product from a contaminated display. These results highlight the importance of the salience and strength of contamination in eliciting negative contamination effects. Finally, The results provide empirical evidence for the role of price in mitigating negative contamination effects. Up to this point, the literature contained only anecdotal evidence for people's ability to overcome feelings of disgust (Angyal 1941). As such, the results also add to the existing literature on how affect influences judgments and decision-making (e.g., Lowenstein et al. 2001; Pochepstova and Novemsky 2010), and how this affect can be moderated.

My research demonstrates the importance of understanding how consumers perceive and interpret different cues in the retail environment in order to manage consumers' overall experiences. The display cues manipulated in my studies are cues that are under managers' control – product availability, shelf organization, and price. The results suggest that managers must be aware of the inferences that consumers draw based on the product display to ensure that they are providing cues that will have positive effects on consumer preferences and avoiding cues that could decrease consumer preferences for the products. While managers may think that they need to strive to maintain fully stocked and organized shelves, this may not always be the best strategy, and an understanding of how consumers respond is important in order to manage the customer experience. While managers can focus on managing the brand, the organization, and the availability of the products, looking at each of the factors in isolation may not be the best approach, given that consumers are making decisions based on the interactions of these factors. Additionally, consumers are exposed to signals of scarcity based on how previous consumers have interacted with products, so while managers may strive to maintain everything fully stocked and organized, they need to be aware of the implications of other customers' interactions with displays on subsequent consumer behavior.

REFERENCES

Angyal, Andras (1941), "Disgust and Related Aversions," *Journal of Abnormal and Social Psychology*, 36 (3), 393-412.

Argo, Jennifer J., Darren W. Dahl, and Andrea C. Morales (2006), "Consumer Contamination: How Consumers React to Products Touched by Others," *Journal of Marketing*, 70 (April), 81-94.

--- (2008), "Positive Consumer Contagion: Responses to Attractive Others in a Retail Context," *Journal of Marketing Research*, 45 (6), 690-701.

Banerjee, Abhijit V. (1992), "A Simple Model of Herd Behavior," *The Quarterly Journal of Economics*, 107 (3), 797-817.

Baron, Rueben M. and David A. Kenny (1986), "The Moderator-Mediator Variable Distinction in Social Psychology Research: Conceptual, Strategic and Statistical Considerations," *Journal of Personality and Social Psychology*, 51 (December), 1173-82.

Boatwright, Peter and Joseph C. Nunes (2001), "Reducing Assortment: An Attribute-Based Approach," *Journal of Marketing*, 65 (3), 50-63.

Borle, Sharad, Peter Boatwright, Joseph B. Kadane, Joseph C. Nunes and Galit Shmueli (2005), "The Effect of Product Assortment Changes on Customer Retention," *Marketing Science*, 24 (4), 616-622.

Brock, Timothy C. (1968), "Implications of Commodity Theory for Value Change " in *Psychological Foundations of Attitudes*, ed. A.G. Greenwald, T.C. Brock and T.M. Ostrom, New York: Academic Press.

Burnkrant, Robert E. and Alain Cousineau (1975), "Informational and Normative Social Influence in Buyer Behavior," *Journal of Consumer Research,* 2*,* 206-215.

Carmon, Ziv, Klaus Wertenbroch and Marcel Zeelenberg (2003), "Option Attachment: When Deliberating Makes Choosing Feel Like Losing," *Journal of Consumer Research*, 30 (1), 15-29.

Chandon, Pierre J., Wesley Hutchinson, Eric T. Bradlow, and Scott H. Young (2009), "Does In-Store Marketing Work? Effects of the Number and Position of Shelf Facings on Brand Attention and Evaluation at the Point of Purchase," *Journal of Marketing*, 73 (6), 1-17.

Cialdini, Robert (1993), *Influence: Science and Practice*, New York: Harper Collins.

Dodes, Rachel (2010), “Penney Weaves New Fast-Fashion Line,” *WSJ.com*, August 11, 2010, http://online.wsj.com/article/SB10001424052748703435104575421580334396678.html.

Fitzsimons, Gavan J. (2000), “Consumer Response To Stockouts,” *Journal of Consumer Research,* 27(2), 249-266.

Frazer, James George ([1890] 1959), *The New Golden Bough: A Study in Magic and Religion*, New York: MacMillan.

Herpen, Erica van, Rik Pieters and Marcel Zeelenberg (2009), “When Demand Accelerates Demand: Trailing the Bandwagon,” *Journal of Consumer Psychology*, 19 (3), 302-312.

Huang, Jen-Hung and Yi-Fen Chen (2006), “Herding in Online Product Choice,” *Psychology and Marketing*, 23 (5), 413–428.

Kahn, Barbara E. and Brian Wansink (2004), “The Influence of Assortment Structure on Perceived Variety and Consumption Quantities,” *Journal of Consumer Research*, 30 (4), 519-533.

Kardes, Frank R., Steven S. Posavac and Maria L. Cronley (2004), “Consumer Inference: A Review of Processes, Bases, and Judgment Contexts,” *Journal of Consumer Psychology*, 14 (3), 230-256.

Latane, Bibb (1981), "The Psychology of Social Impact," *American Psychologist*, 36 (4), 343-56.

Leclerc, France, Christopher K. Hsee and Joseph C. Nunes (2005), “Narrow Focusing: Why the Relative Positioning of a Good in its Category Matters More Than it Should,” *Marketing Science*, 24 (2), 194-205.

Lemon, Katherine N. and Stephen M. Nowlis (2002), “Developing Synergies Between Promotions and Brands in Different Price-Quality Tiers,” *Journal of Marketing Research*, 39 (May), 171-185.

Lerner, Jennifer S., Deborah A. Small, and George Lowenstein (2004), "Heart Strings and Purse Strings Carryover Effects of Emotions on Economic Decisions," *Psychological Science*, 15 (5), 337-41.

Lowenstein, George F., Elke U. Weber, Christopher K. Hsee and Ned Welch (2001), “Risk as Feelings,” *Psychological Bulletin*, 127 (2), 267-286.

Lynn, Michael (1989), "Scarcity Effects on Desirability: Mediated by Assumed Expensiveness?," *Journal of Economic Psychology*, 10, 257-74.

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

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

Morales, Andrea C. (2005), "Giving Firms An "E" For Effort: Consumer Responses to High-Effort Firms," *Journal of Consumer Research*, 31 (March), 806-12.

Morales, Andrea C. and Gavan J. Fitzsimons (2007), "Product Contagion: Changing Consumer Evaluations Though Physical Contact With "Disgusting" Products," *Journal of Marketing Research*, 44 (May), 272-83.

Neslin, Scott A. (2002), "Sales Promotion," *Marketing Science Institute*, Relevant Knowledge Series.

Nowlis, Stephen M., Ravi Dhar, and Itamar Simonson (2010), "The Effect of Decision Order on Purchase Quantity Decisions," *Journal of Marketing Research*, 47 (August), 725-737.

Osselaer, Stijn M.J. van and Joseph W. Alba (2000), "Consumer Learning and Brand Equity," *Journal of Consumer Research,* 27 (1), 1-16.

Pochepstova, Anastasiya and Nathan Novemsky (2010), "When do Incidental Mood Effects Last? Lay Beliefs versus Actual Effects," *Journal of Consumer Research*, 36 (6), 992-1001.

Preacher, Kristopher J. and Andrew F. Hayes (2004), "SPSS and SAS Procedures for Estimating Indirect Effects in Simple Mediation Models," *Behavior Research Methods, Instruments, and Computers,* 36, 717-731.

Snyder, C. R. and Howard L. Fromkin (1980), *Uniqueness: the Human Pursuit of Difference*, New York: Plenum.

Sobel, Michael E. (1982), "Asymptotic Confidence Intervals for Indirect Effects in Structural Equation Models," In S. Leinhardt (Ed.), *Sociological Methodology 1982* (pp. 290-312), Washington DC: American Sociological Association.

Stock, Axel and Subramanian Balachander (2005), "The Making of A "Hot" Product: A Signaling Explanation of Marketers' Scarcity Strategy," *Management Science*, 51 (8), 1181-92.

Turley, L. W. and Ronald E. Milliman (2000), "Atmospheric Effects on Shopping Behavior: A Review of the Experimental Evidence," *Journal of Business Research*, 49, 193-211.

Verhallen, Theo M.M. (1982), "Scarcity and Consumer Choice Behavior," *Journal of Economic Psychology*, 2, 299-321.

Verhallen, Theo M.M. and Henry S.J. Robben (1994), "Scarcity and Preference: An Experiment on Unavailability and Product Evaluation," *Journal of Economic Psychology*, 15, 315-331.

Yorkston, Eric A., Joseph C. Nunes and Shashi Matta (2010), "The Malleable Brand: The Role of Implicit Theories in Evaluating Brand Extensions," *Journal of Marketing*, 74 (1), 80-93.

Zhang, Shi and Sanjay Sood (2002), "Deep and Surface Cues: Brand Extension Evaluations by Children and Adults," *Journal of Consumer Research*, 29 (1), 129-141.

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

APPENDIX A

INSTITUTIONAL REVIEW BOARD APPROVAL FORM

To:	Andrea Ketcham BAC
From:	Mark Roosa, Chair Soc Beh IRB
Date:	09/24/2008
Committee Action:	**Exemption Granted**
IRB Action Date:	09/24/2008
IRB Protocol #:	0809003293
Study Title:	"Popular or Gross? The Effect of Display Organization and Inventory on Consumer Preference"

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal or civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.