

Shopping Interdependencies: How Emotions Affect Consumer Search and Shopping Behavior

Kristin Diehl

Andrea C. Morales

Gavan J. Fitzsimons

Duncan Simester*

February 2014

*Kristin Diehl is associate professor of marketing at the Marshall School of Business, University of Southern California, 3660 Trousdale Pkwy 306E, Los Angeles, CA 90089-0443, phone (213) 740-5054, fax (213) 740-7828, (kdiehl@usc.edu). Andrea C. Morales is J. Willard and Alice S. Marriott Foundation Professor of Marketing at the W.P. Carey School of Business, Arizona State University, P.O. Box 874106, Tempe, AZ 85287-4106, phone (480) 965-6122, fax (480) 965-8000, (acmorales@asu.edu). Gavan J. Fitzsimons is the R. David Thomas Professor of marketing and psychology at the Fuqua School of Business, Duke University, Durham, NC 27708, phone (919) 660-7793, fax (919) 681-6245, (gavan@duke.edu). Duncan Simester is the NTU Professor of Management Science at the MIT Sloan School of Management, Room E40-177, 1 Amherst St, Cambridge, MA 02142, phone (617) 258-0679, fax (617) 617 258-7597, (simester@mit.edu). The authors thank Joshua Ackerman and Lisa Cavanaugh for their insightful feedback on a previous version of the manuscript.

Shopping Interdependencies:

How Emotions Affect Consumer Search and Shopping Behavior

Prior research has shown that inducing disgust reduces willingness to pay (WTP), while inducing sadness increases WTP for unrelated products. This might suggest that inducing disgust during a shopping trip would lead consumers to pay lower average prices for unrelated products on the same shopping trip, while inducing sadness would increase prices paid. However, we show that disgust and sadness also affect customer search, leading to a different pattern of results for prices paid versus WTP. Shopping for a disgusting product can reduce subsequent search for unrelated products purchased during the same shopping trip, leading consumers to pay higher prices. Shopping for a sad product, however, can increase search and thus lower the prices paid for unrelated products. Our findings highlight the role of search as a critical component of the shopping process that was previously overlooked when examining the impact of emotions and emotion-specific action tendencies on economic decision making.

Introduction

Consumer decision making research often treats product choice as an independent, one shot decision. However, everyday purchase decisions frequently are embedded in a stream of other purchase decisions. Our research focuses on interdependencies across purchases that may exist even for products that are not functionally or consumptionally related, but that are purchased during the same shopping trip. Specifically, we focus on how shopping for a product that evokes specific emotions can alter how consumers shop for other products. During a single shopping trip involving multiple, sequential choices, the emotional consequences of one decision may act as incidental emotions for subsequent choices (Cavanaugh, Bettman, Luce, and Payne 2007). Prior research has typically not considered such sequential choices that occur frequently in marketing and has also not examined how such incidental emotions may affect evaluative responses differently compared to behavioral responses. We show that incidental emotions from a previous decision can not only affect consumers' stated evaluations for a subsequent decision, such as willingness to pay, but can also have significant behavioral consequences, such as changing the amount consumers search. As search may affect the products and prices to which consumers are exposed, the extent to which consumers search often may determine how much they ultimately pay for a product.

Recent research has begun to examine how different specific emotions influence various domains of consumer behavior, including shopping (e.g., Argo, Dahl, and Manchanda 2005), evaluation (e.g. Goldsmith, Kim and Dhar 2012), consumption (e.g., Garg, Inman and Mittal 2005), choice (e.g., Raghunathan and Pham 1999; Ramanathan and Williams 2007), and persuasion (e.g. Agrawal and Duhachek 2010). In particular, Lerner, Small, and Loewenstein (2004) demonstrated how incidental emotions can influence economic decisions, showing that

emotions induced in unrelated tasks can carry over and can subsequently impact willingness to pay, with sadness increasing and disgust decreasing willingness to pay (WTP) for an unrelated, neutral product.¹ Although this finding is important and compelling, we believe Lerner et al.'s (2004) findings warrant further examination in shopping situations because of two important distinctions that characterize many consumer purchase situations: 1) emotions may be induced by earlier decisions within the same shopping trip rather than by unrelated situations, and, more importantly, 2) the prices customers actually pay often depend on their search behavior. This second distinction recognizes that WTP only provides an upper bound on the price that is actually paid. The price paid also depends upon the distribution of prices in the marketplace, and the extent to which customers engage in search. This distinction is important because emotions and the action tendencies they are associated with may not just affect evaluative responses such as WTP, but may also alter behavioral responses such as the extent of customer search.

Although recent work (Miller et al. 2010) provides evidence that WTP values are equivalent to more sophisticated elicitation methods (e.g. Becker, DeGroot, and Marschak 1964), these elicitation methods do not take into account which prices consumers are able to find in the marketplace. If the outcome of the shopping process depends on the level of customer search, then the influence of emotions on WTP may differ substantially from the influence of emotions on the prices that consumers *actually* pay. Therefore, in order to gain a better understanding of how emotions influence actual prices paid, it is important to examine the relationship between emotions, appraisal tendencies, and consumer search.

Imagine two consumers visit their local supermarket to buy multiple items. Consumer A needs to buy toilet tissue, while Consumer B needs to buy facial tissue. Because toilet tissue

¹ Note that Cryder, Lerner, Gross, and Dahl (2008) also found sadness increases willingness to pay values.

evokes moderate levels of disgust and facial tissue is an emotionally neutral product (Rozin, Millman and Nemeroff 1986; Morales and Fitzsimons 2007), previous research (e.g., Lerner et al. 2004) would predict that Consumer A shopping for toilet tissue would be willing to pay significantly less for *other* unrelated products subsequently purchased on the same shopping trip compared to Consumer B who is shopping for facial tissue. However, taking into account the effect different emotions and their associated action tendencies may have on search behavior ultimately reveals a different pattern of results for prices paid in shopping settings than for WTP.

Building on Lerner et al. (2004), our investigation focuses on products that are able to induce specific emotions; in particular, disgust and sadness. While there are many emotions of interest to marketers, we focus on disgust and sadness for their prior treatment in the literature and the clear predictions with regard to their impact on consumer search. Further, Lerner et al. suggest that because disgust and sadness differ in terms of the associated action tendencies, they lead to differences in WTP. We add to this argument by suggesting that these action tendencies do not only affect more evaluative judgments such as WTP but that they can also impact behaviors such as search. As such, our findings align with recent work by Cohen and colleagues (2011) that demonstrates the importance of distinguishing between evaluative and behavioral responses to experienced emotions. For transgressions triggering shame, the authors find that greater negative *evaluative* responses (e.g. feeling like a bad person) are associated with *less* unethical behavior, whereas greater *behavioral* responses (e.g. avoiding others) are associated with *more* unethical behavior. Similarly, our research demonstrates in a shopping setting the importance of distinguishing between evaluative responses (i.e. WTP) and a more behavioral response (i.e. search) when trying to assess how emotions may affect the prices consumers ultimately pay.

Prior research (e.g. Lazarus 1991) suggests that disgust is associated with the tendency to avoid and withdraw. Not only should this reduce WTP, as has been previously shown, but we argue this tendency should also limit search for other products purchased on the same shopping trip. Further, Lerner et al. argue that sadness is associated with a desire to change one's circumstances. In addition to increasing WTP, this action tendency may also encourage search overall, as customers make an effort to seek out other products. Even though sadness is low in activation, prior research has linked depression to compulsive shopping (Black, Repertinger, Gaffney, and Gabel 1998). Further, sadness has also been associated with more systematic processing and usage of specific information (see Schwarz 1998 for a review) which may also foster search. Taken together, we expect that disgust tends to reduce search, whereas sadness tends to increase search. In general, greater search will expose consumers to a wider range of products and prices. Hence we anticipate that greater search will tend to result in consumers paying lower prices and that spending more time in the store may lead to customers purchasing additional products (Milliman 1982). Inducing disgust, however, should reduce search and thus should lead customers to pay higher average prices than inducing sadness and may also limit the number of products consumers consider or purchase.

We test our predictions using a laboratory experiment and the analysis of a very large sample of transactional data. The laboratory study carefully controls the shopping environment and was designed to examine how incidental emotions induced by shopping for one product may affect the search and decision process for other products. Specifically, in the lab we induce either disgust or sadness using a product evaluation task, similar to examining a product on the shelf. We then examine how the incidental emotion induced by this initial product affects WTP values compared to prices actually paid after searching for different, neutral products. By doing so, we

are able to replicate the previously found effects of disgust and sadness on WTP measures (Lerner et al. 2004), but, more importantly, we show that the same pattern does not hold for prices paid when search is an integral part of the purchasing process. We find that disgust induced by shopping for one product results in less search and higher prices paid for other, subsequently purchased, neutral products, whereas sadness results in greater search and lower prices paid.

We complement these findings with transaction data from a retail chain of convenience stores. We provide evidence that consumers buying disgusting items pay higher prices (i.e. full price vs. on promotion) for a larger proportion of their remaining items and also purchase fewer additional items. We argue that these findings are consistent with consumers engaging in less intensive product and price search when they are purchasing disgusting items.

Returning to our motivating example, in contrast to previous work focusing on willingness to pay, our findings suggest that consumer A (who purchases toilet tissue) will actually pick higher priced products on the same shopping trip than consumer B (who purchases facial tissue). In particular, Consumer A will tend to spend less time searching other product categories, resulting in fewer purchased products and higher prices paid for those products compared to Consumer B.

Conceptual Background

Consistent with appraisal-tendency theory, recent work on emotions demonstrates that it is not merely valence that determines how people will respond in a given context (e.g. Ragnathan and Pham 1999). Of particular relevance to research in consumer settings, Lerner et al. (2004) showed that two different negative emotions, disgust and sadness, have diverging effects on consumer willingness to pay estimates because of their unique appraisal tendencies.

Specifically, they examined how incidental disgust and sadness elicited in an earlier, unrelated task, can influence the endowment effect – an established finding in economics that shows willingness to pay to obtain an object is often lower than the compensation required to part with the same object (Kahneman, Knetsch, and Thaler 1991). Because disgust is associated with an appraisal of being too close to an offensive person, object, or concept (Lazarus 1991), it triggers an action tendency to avoid contact with other objects and distance oneself from current surroundings (Rozin, Haidt and McCauley 1993). In contrast, sadness typically stems from the loss or absence of a person or an object and activates an immediate need to acquire or substitute an option (Ragunathan and Pham 1999). Thus, consistent with these appraisal tendencies, when Lerner et al. (2004) induced disgust, participants reported lower willingness to pay prices, but when they induced sadness, participants reported higher willingness to pay prices.

In most purchase contexts, however, consumers do not have the power to name their own price but instead learn about prevailing prices via search. The extent to which consumers engage in search for lower prices is likely to have an important impact on the prices they pay, with greater search generally increasing the likelihood of finding lower prices. Notably, even though consumers may have a higher willingness to pay for a product, they will happily pay less if they find lower prices. Hence, in order to gain a fuller understanding of how emotions can affect what prices consumers actually pay, it is essential to examine the relationship between emotions, appraisal tendencies, and search.

Effects on Product and Price Search

We focus our discussion and empirical investigation on sadness and disgust, due to their previously documented effects on willingness to pay (Lerner et al. 2004; Cryder et al. 2008). We

argue that shopping for a specific emotion-laden product will trigger appraisal tendencies that will not just affect stated WTP for a subsequent, unrelated product, but will also influence other portions of a shopping trip, in particular altering search in unrelated product categories.

Prior research has shown that, by altering the consideration set, product search can have a strong influence on product choice (e.g. Hauser 1978, Diehl 2005). Indeed *which* product categories consumers seek out in the store and the extent to which they search in those categories can have substantial impact on the type of products that are considered and ultimately chosen (e.g. Moorman et al. 2004). Similarly, we show that emotions that alter product search can have important effects on basket composition.

Our research also contributes to a long line of research examining the factors governing consumer price search (e.g. Urbany, Dickson, Kalapurakal 1996, Ailawadi, Neslin, Gedenk 2001). This prior research has demonstrated that situational constraints (e.g. budget or time constraints) as well as consumer traits (e.g. shopping mavenism, price consciousness) can affect price search. The current research focuses on the situational impact that emotions induced during the shopping trip can have on price search. Specifically, we show that emotions that increase price search can lead consumers to choose lower priced items, while emotions that decrease price search cause consumers to pay higher prices. In so doing, we provide the first theoretical and empirical support defining the relationship between emotions and search.

Sadness, Disgust, and Search Behavior

Building on prior research (Lerner et al. 2004), we focus on two negative emotions, sadness and disgust, that are induced through product purchases, and examine the effect such incidentally evoked emotions have on subsequent shopping behavior. Sadness, an extremely

unpleasant emotion, is characterized by feelings of loss and helplessness and high appraisals of situational as opposed to human control (Keltner et al., 1993; Lazarus 1991). As such the feeling that something is missing should lead people to seek out ways to acquire options that may fill that void (Ragunathan and Pham 1999; Rick et al. 2014). This inherent combination of a feeling of loss and the desire to change one's circumstances is believed to be responsible for sad individuals reporting higher willingness to pay values (Lerner et al. 2004; Cryder et al. 2008). This reasoning is consistent with research in psychology supporting a causal link between compulsive shopping and depression (Black et al. 1998; Christenson et al., 1994; Faber and Christenson 1996), work in marketing on using self-gifts to improve self-esteem (Mick and Demoss 1990), as well as recent research showing higher willingness to pay values for products purchased for a sad situation such as a funeral or memorial service (McGraw and Davis 2011).

In addition to increasing willingness to pay values, we argue that the change-focused appraisals associated with sadness will also alter consumer search behavior, such that consumers will spend more time searching for and evaluating other options when experiencing even moderate feelings of sadness. When consumers engage in greater search, they also may be exposed to a wider range of prices and will likely pay lower prices. Hence, even though sad consumers may be willing to spend more to acquire a product, by engaging in greater search we expect them to be exposed to and ultimately choose lower priced items.

In contrast to sadness which triggers implicit approach behavior towards other products, disgust is characterized by an extreme unwillingness to attend to a situation or a rejection appraisal. Furthermore, because disgust is often triggered by close physical proximity to an offensive person, object, or concept, it leads to a very strong "shut out and get away" reaction when evoked (Smith and Ellsworth 1985). Thus, disgust can lead to avoidant behavior not only

with respect to the actual source of disgust but also to other, unrelated objects, people, or situations. In addition, disgust is also characterized by appraisals of high certainty and attributions of human control. This suggests that when a situation causes people to feel disgusted, although they do not want to attend to it, they feel certain that they know how to deal with the problem and have the ability to do so.

This combination of high human control appraisals and avoidant tendencies is believed to lead disgusted individuals to report lower willingness to pay values for other products (Lerner et al. 2004). We argue that the same avoidant behavior should also impact consumer search behavior. Specifically, disgust's immediate "shut out and get away" response should also significantly reduce the extent to which consumers search for other, unrelated products and prices. As a result, we propose that disgusted consumers are likely to buy fewer products and pay higher prices for those products they do purchase.

Triggers of sadness and disgust in a shopping context

Prior research has mostly examined the effect of incidental emotions in separate task paradigms with unrelated emotion inductions (e.g. writing tasks). While these are important procedures to examine psychological mechanisms, they do not easily translate to actual shopping situations in marketing. Instead, in the current research we are interested in shopping contexts where one product decision may act as an incidental emotion for subsequent, more neutral product decisions. In particular, we focus on products and choices that can induce sadness and disgust for their prior treatment in the literature and the clear predictions with regard to their impact on consumer search.

Note that in a shopping context the products per se are not necessarily sad or disgusting,

but rather their intended usage and the images they evoke are what create emotional reactions. For example Rozin, Millman and Nemeroff (1986) find that people react differently when imagining using toilet tissue versus facial tissue to blow one's nose, even though the product itself is very similar. In addition to different product categories (e.g. toilet vs. facial tissues), different product *elements* may further impact such imagery and hence may also affect the extent to which products induce emotions. Thus in a shopping context, how products are packaged (Morales and Fitzsimons 2007), named (Isen, Labroo, and Durlach 2004) or displayed in the store (Cavanaugh 2011) may induce emotions to varying degrees. For example large pictures of dead cockroaches on insect killers (e.g. on Raid products) may not just communicate effectiveness (Zhu 2012) but may also trigger greater disgust than packaging that does not employ such images. Similarly, some product names may create stronger emotive responses than others. For example in a pretest we found that the brand "Scoop Away," which emphasizes the disgusting nature of cat litter, elicited somewhat greater feelings of disgust than "Tidy Cat" ($M_{SA} = 3.52$, $M_{TC} = 3.37$, $F(1, 151) = 3.61$, $p < .06$). While we cannot test such nuances in product elements in detail, we take advantage of the fact that national brands generally are more highly associated with their respective product categories and as such are more closely linked with the categories' emotive values than private labels. Using transactional data, we investigate this issue empirically by examining differences in how consumers respond to the same type of product marketed as a private label versus a national brand, expecting stronger effects on consumer search when the disgust inducing product is a national brand (vs. a private label brand).

In summary, we examine the proposed relationship among incidental emotions, WTP, search and prices paid using a controlled laboratory study and by analyzing transaction data of actual shopping behavior. More specifically, in study 1 we consider the effects of sadness and

disgust on search and prices paid. Using real-life products to incidentally induce disgust and sadness, we show that incidental disgust reduces search for a subsequent purchase, while incidental sadness increases subsequent search. As expected, greater search is associated with paying lower prices, while limited search leads to higher prices paid.

Further, in study 2 we examine our proposed process in a real life setting, demonstrating the generalizability of our laboratory findings. Across a wide range of products we find evidence that purchasing more disgusting items reduces product search as evidenced by smaller transactions with fewer items. In addition, we also find evidence of limited price search, as baskets with more disgusting items contain a smaller proportion of discounted items. Further, these effects appear stronger when disgust inducing items are national brands as opposed to private labels.

Study 1

Effects of emotions on willingness to pay and prices paid

The goal of study 1 was to examine whether incidentally inducing emotions in a product evaluation task affect respondents' stated WTP differently from prices they actually pay for other, neutral products purchased subsequently. Consistent with Lerner et al.'s (2004) findings, we predict that inducing disgust compared to sadness will lead to lower stated WTP. However, prices consumers actually pay depend on the amount of product search in which consumers engage. We predict that inducing disgust reduces the degree of consumer search compared to inducing sadness. Consumers who search less will be less likely to find lower prices for a product; hence we expect reductions in search to lead to customers paying *higher* prices on average.

Similar to Lerner et al. (2004), we also examine the effect of incidental emotions on other purchase decisions. However, we extend the applicability of Lerner et al.'s (2004) findings to everyday consumer settings in two ways: (1) In contrast to unrelated videos and subsequent writing induction tasks, we examine incidental emotions induced by product tasks that mimic the sequential decisions consumers engage in during everyday shopping trips (Cavanaugh et al. 2007), (2) While using vivid videos and writing inductions are standard procedures in the literature, designed to evoke strong affective responses, our manipulations elicit only moderate levels of a specific emotion that are more akin to everyday purchasing situations. Thus, our findings are well-suited to generalize to purchasing occasions where only moderate levels of emotions are evoked in sequential shopping decisions.

Procedure and Measures

Study 1 consisted of two parts. In part 1, emotions (sadness or disgust) were induced using a shopping relevant task. Participants were given a product from a product category selected to be either disgust inducing (a new package of anti-diarrheal medicine) or sadness inducing (a new, unaddressed sympathy card). Note that for each condition we used several different individual products from each product category (i.e., different sympathy cards, different SKUs of diarrhea medicine) to induce sadness or disgust, ensuring generalizability beyond a single product. Participants were asked to examine the product they received and to complete a brief survey that asked them to evaluate that product, with a particular focus on its packaging; all questions focused on the physical aspects of the product and no questions referred to the emotive nature of the product.

In order to establish the effectiveness of this manipulation, in a separate pre-test, 115

participants from the same participant pool only completed this first part of the study (i.e. the product evaluation task). Immediately following the product evaluation task, following Lerner et al. (2004), participants indicated the extent to which, at that very moment, they experienced certain feelings using a scale from 0 (Not at all) to 8 (More strongly than ever). Participants were given a list of 27 affective states, which included the focal states of blue, downhearted, and sad (Sadness Index Cronbach alpha = .86), as well as disgust, repulsed, and turned off (Disgust Index Cronbach alpha = .78). Using these indices, those who evaluated the sympathy card ($M_{SC} = 1.78$) reported significantly stronger feelings of sadness than those who evaluated the diarrhea medicine ($M_{DM} = 1.08$, $F(1,113) = 4.78$, $p < .05$). Further those who evaluated diarrhea medicine ($M_{DM} = 1.72$) felt significantly more disgusted than those who evaluated the sympathy card ($M_{SC} = .90$, $F(1,113) = 7.15$, $p < .01$). Note that the absolute levels of these emotions are quite low, akin to what we would expect consumers to experience during everyday shopping tasks.

Participants in the main study did not report on their emotive state following the product evaluation task. Instead, subsequent to completing the product evaluation in part one, participants proceeded to a second, ostensibly unrelated study. In the second study, conducted on a computer, participants were either asked to search for and choose a neutral product, or were asked to state their willingness to pay for a neutral product. 169 undergraduate students participated in this study as part of a larger research session for which they received course credit.

Participants assigned to the search task were presented with the brand name and picture of ten different products (see Figure 1). For each participant a unique random ordering of these ten products was created, and products were displayed in two rows on the screen. We repeated the task of searching and choosing a single item from ten products in two different, neutral

product categories (i.e., sunscreen, box of pens), with the order of product categories counterbalanced. To try and mimic search at a real store, in order to learn more about an item, such as its features and price, participants had to click on the picture. Note that an item had to be examined before it could be purchased. In each category, prices ranged from \$0.50 to \$9.50 in one dollar increments. These prices matched the values presented to participants in the willingness to pay task, as described below. Prices were assigned in accordance with prices observed in the market place. We ordered products by their actual price found in the market place, and then assigned the product's price in the study accordingly (i.e. the cheapest product in each product category was sold at \$0.50 and the most expensive product was sold at \$9.50).

Participants faced an incentive compatible situation in which choices had real consequences for participants. Participants were given a \$12 budget for each of the two purchases and were told that one randomly determined participant in each session would receive one of the products he or she had chosen as well as the money left-over after 'paying' for that product. They were also told a priori that products ranged between \$0.50 and \$9.50, which provided a particularly conservative test of our hypothesis, as all participants knew how much better they could do by searching for more options. The computer captured the number of items for which information was acquired, how long participants spent examining this information, and which item was chosen at what price.

Figure 1 about here

Participants assigned to the willingness to pay condition also first engaged in the product evaluation task designed to induce either disgust (anti-diarrheal medicine) or sadness (sympathy card). They then engaged in a WTP elicitation task modeled after Lerner et al.'s (2004) procedure. Participants completed the WTP task for all 20 neutral products available in the

search condition, blocked by product category (they evaluated all sunscreens first, then all pens, or vice versa). The order of products participants evaluated was randomly determined. For every product, each participant was given a series of decisions to make between receiving that product or receiving a dollar amount between \$0.50 and \$9.50, ascending in one dollar increments.

Following prior research (e.g. Morewedge et al. 2009), we used the last dollar amount a participant was willing to give up instead of receiving this product as his or her WTP. Due to the large number of product evaluations made and the likelihood that the effect of the manipulation would vanish with each product evaluation, we used the WTP of the first product participants ever evaluated (either a sunscreen or a pen) as the dependent measure, and in the analysis, use the average WTP for products in the other product category (i.e. average WTP for pens if focal product was a sunscreen and vice versa) to control for individual differences in WTP. Note that like the search task this WTP task also had real consequences to participants, as they were told that one person per session's decision would be randomly selected and implemented.

Following the completion of the search or WTP task respectively, participants were asked to what extent the previously evaluated product (i.e. either anti-diarrheal medicine or sympathy card) made them feel disgusted and sad. Each of these single-item manipulation check measures used a 7-point scale (1= not all, 7= very); the order of the two manipulation checks was counterbalanced.

Results

Manipulation Check. We analyzed participants' feelings of disgust and sadness using a 2 (emotion: sadness, disgust) by 2 (task: WTP, search) between subject ANOVA. As expected, participants who initially evaluated anti-diarrheal medicine retrospectively reported having

experienced significantly higher levels of disgust ($M_{DM} = 3.50$) than those who evaluated a sympathy card ($M_{SC} = 2.46$, $F(1, 165) = 17.82$, $p < .0001$). Further, participants who evaluated a sympathy card reported having experienced greater sadness ($M_{SC} = 4.30$) than those who evaluated anti-diarrheal medicine ($M_{DM} = 2.70$, $F(1, 165) = 46.41$, $p < .0001$). Other than this main effect of emotion, no other effects were significant.

WTP Task. For those assigned to the WTP task, we analyzed participants' WTP using a 2 (emotion: sadness, disgust) by 2 (focal product: sunscreen, pen) between subject ANCOVA controlling for age ($b = 0.35$, $F(1,74) = 2.33$, $p < .14$) and average WTP in the non-focal category ($b = 0.43$, $F(1,74) = 6.40$, $p < .02$). We found a main effect of product category ($M_{Pens} = \$2.18$, $M_{Sunscreen} = \$4.24$, $F(1,74) = 15.06$, $p < .001$). In order to test whether, as predicted, WTP was lower for the disgust compared to the sadness condition, we estimated a planned, directional contrast (one tailed). We replicate Lerner et al.'s (2004) pattern of results, observing that participants for whom disgust was induced in the previous product task report lower WTP ($M_D = \$2.78$) than those for whom sadness was induced ($M_S = \$3.76$, $F(1,74) = 2.41$, $p = .06$).

Search Task. For those assigned to the search task, we analyzed time spent searching (in seconds) using a 2 (emotion: sadness, disgust) by 2 (order of product category) by 2 (product: sunscreen and pen) mixed ANOVA. We find a main effect of trial ($M_{T1} = 81.90$ seconds, $M_{T2} = 69.32$ seconds, $F(1,81) = 7.40$, $p < .01$), and a main effect of product ($M_{Pens} = 70.96$ seconds, $M_{Sunscreen} = 80.26$ seconds, $F(1,81) = 3.80$, $p = .05$). More importantly, when sadness was induced, participants searched longer ($M_S = 84.70$ seconds) compared to when disgust was induced ($M_D = 67.53$ seconds, $F(1,81) = 3.26$, $p = .08$), showing initial support for our prediction that the distancing tendency associated with disgust can affect search.

More importantly though, we were interested in the extent to which participants engaged

in product search as a potential driver of prices paid. Using the same type of analysis as for time spent searching, we analyzed the number of unique products participants examined when shopping (ranging from 1 to 10). We again found a main effect of product ($M_{\text{Pens}} = 6.38$, $M_{\text{Sunscreen}} = 5.61$, $F(1,81) = 5.60$, $p < .05$). Importantly, incidental emotions also affected how many products were examined such that participants in the sadness condition examined significantly more products ($M_{\text{Sad}} = 6.66$) than those in the disgust condition ($M_{\text{Disgust}} = 5.40$, $F(1,81) = 4.66$, $p < .05$).

Effect of Search on Prices Paid. As shown above, sadness and disgust had direct effects on both evaluative (WTP) and behavioral (search) responses. We predicted that greater search triggered by sadness will expose participants to a wider range of prices allowing them to choose lower priced items, while reductions in search due to disgust will lead to higher prices paid. As expected, based on prior research, prices paid were negatively correlated with the number of unique products searched ($r = -0.21$, $p < .01$). Note, however, that prices paid were not related to overall time searched ($r = -0.07$, $p > .3$). This latter finding reflects the different nature of these search measures. The number of items searched directly reflects the extent to which greater search exposes consumers to a wider range of prices, while overall search time subsumes both exposure to price as well as examination of other product information.

In order to test for the mediating effect of product search on prices paid, we collapsed across the two product categories, averaging prices paid and unique products searched across both product trials. Following the recommended technique for testing indirect effects (Hayes 2013), we conducted a mediation analysis using average price paid as the dependent variable, condition (sad=1, disgust=0) as the independent variable, and average number of unique products searched as the mediator. The confidence interval for the indirect effect of incidental

emotions on prices paid through unique products searched was significant at 95% (lower bound: -0.729, upper bound: -0.034). This analysis provides evidence for indirect-only mediation (Zhao, Lynch, and Chen 2010) , showing that searching for unique options mediates the relationship between emotions and prices paid, such that greater search triggered by sadness lowers prices paid, whereas disgust induced reductions in search increases price paid.

Discussion

Study 1 makes a number of important contributions to distinguish the effects of incidental emotions and their associated action tendencies on WTP versus prices paid in shopping settings. In terms of stated WTP, we replicate findings by Lerner et al. (2004) that show lower willingness to pay when consumers incidentally experienced disgust, but higher WTP when they experienced sadness. Building on Lerner et al.'s findings, our results suggest that even the subtle manipulation of evaluating a product that can be readily found in any supermarket can have considerable effects on stated WTP.

More importantly, we showed that incidentally inducing emotions can also affect the extent to which consumers search. We demonstrate that incidental disgust substantially reduces the overall time consumers spend searching for neutral products in an unrelated task, while sadness leads to significantly more time being spent searching. In fact, inducing sadness lengthened search by about 20% and extended search to approximately 20% more products than if disgust was induced. Importantly though for prices paid, when disgust was induced, participants searched fewer items and hence were exposed to a smaller range of prices, whereas sadness increased search and thus exposure to prices. Note that these results demonstrating reductions in search may be conservative as participants were incentivized to find a lower price

and knew the range of prices they could find at the click of a button. Finally, the mediation analysis demonstrates the importance of search as an intervening driver of actual prices paid. Hence, while those experiencing disgust state lower willingness to pay than those experiencing sadness, to the extent that they truncate their search, they actually end up paying higher prices.

Study 1 demonstrates the substantive importance of distinguishing between the evaluative consequences of incidentally induced emotions such as WTP and more behavioral consequences such as search. Paralleling previous findings, we show that emotions have a direct effect on the evaluative WTP measure. However, as evidenced by the mediation analysis, the effect of emotions on prices paid is an indirect only, providing strong support for the search driven mechanism. It is only to the extent that sadness and disgust alter the amount of search in which participants engage that these emotions affect prices paid. As such, our study contributes further evidence to the notion that evaluative and behavioral responses can differ not just in the pattern of results and eventual outcomes, but also in the underlying mechanisms.

In study one, we examine the effects of incidentally induced emotions in a controlled laboratory setting where the intervening search mechanism can be clearly observed and measured. Further, the emotion induction task is highly naturalistic to mimic actual shopping situations. However, the controlled laboratory setting limits the range of products and prices to which participants are exposed. Only two product categories were used to induce emotions and their incidental effect was observed only for two neutral product categories. A field setting as in study 2 allows us to observe the proposed effect across a wider range of available products and prices, establishing the generalizability of our findings beyond the laboratory settings.

Further, study 1 forced participants to choose one item from each of the two neutral categories. As such we were unable to see whether the extent of search consumers engage in

would also affect the number of product categories they consider and the number of items they buy. Study 2, which uses transactional data, allows us to examine a much larger number of purchase decisions which vary in the number of items purchased from different product categories further generalizing our laboratory findings.

Study 2 – Market Basket Composition With and Without Disgusting Products

Study 2 differs from and extends study 1 in several important ways. First, study 1 showed that shopping for a sad compared to a disgusting product can affect consumer search and purchasing decisions in subsequent shopping tasks. While convenience stores and supermarkets contain many items that elicit at least moderate levels of disgust, there are fewer items that on their own appear to trigger sadness (we discuss this further in the next section). Hence, study 2 will focus on providing evidence of *disgust's* effect on actual purchase behavior. Second, since we cannot observe search directly, we use the number of items purchased and the number of product categories from which consumers purchase as evidence of *product* search. Third, in the lab, we can ensure that everyone purchases the exact same focal products. Therefore, it makes sense to examine prices paid for the focal, neutral item, as evidence of disgust's impact on *price* search. However, in the transactional data, prices vary greatly across product categories and brands, and shoppers vary significantly in terms of which categories and brands they purchase in any one transaction. Hence, we cannot focus on prices paid for a focal product as an indicator of price search. We do, however, rely on the same underlying logic as before; that is, more search exposes consumer to a larger range of products at different prices, including those on sale or

promotion. Consistent with this premise, instead of prices paid for a focal product, in Study 2, we use the percentage of basket items customers purchased at a discount as evidence for *price* search.

As discussed before, in a store setting, emotions often appear to be triggered by the mental images evoked, rather than the physical appearance of the products. For example, toilet tissue and facial tissue are both hygienic paper products that are equally sanitary and often located on the same aisle, but toilet tissue has been shown to evoke relatively higher levels of disgust (Rozin, Millman and Nemeroff 1986). This suggests that how products and product categories are labeled and presented in the store may be crucial in determining the extent to which they evoke emotions. Further, national brands are often uniquely identified and associated with a specific product category (e.g. Immodium A-D with diarrhea medicine, Charmin with toilet paper, etc.), while retailers' private label brands (e.g. Safeway diarrhea medicine, Walgreens toilet paper, etc.) are shared across a broad range of product categories. Therefore, national brands may evoke stronger emotive reactions which may strengthen the effects on consumer search and the corresponding basket composition.

Data

We received transaction data from a retail chain of convenience stores that sells health and beauty and general merchandise items. The stores are smaller than most supermarkets and are located in convenient residential and urban locations. The data comprises a 20-month purchasing history by a random sample of 779,734 customers including approximately 17 million transactions. Each transaction represents a shopping basket on a single visit to the store. These 17 million transactions included an average of 4.47 items, representing a total purchase

volume of almost 75 million items.

Selection of Disgusting Product Categories

To analyze the transaction data we need a measure of the disgust evoked by different products. Morales and Fitzsimons (2007) offer such a measure at the product category level; they provided 140 respondents with a list of the 50 most frequently purchased non-food product categories (as defined by the Food Institute's Food Industry Review, 2004) and asked the respondents to rate the extent to which they thought each of these product categories was disgusting using a scale from 1 (not at all disgusting) to 10 (extremely disgusting).

Our study of the transaction data focuses on products from 45 of these product categories. Two categories (cigarettes and tobacco) were omitted because the distributions of disgust ratings were distinctly bi-modal, presumably distinguishing smokers and non-smokers (Morales and Fitzsimons 2007). We also omitted three categories (foil pans, kitchen storage and laundry care) because products in these categories were generally not available at the chain of convenience stores that provided the transaction data. The remaining categories and their associated disgust ratings are reported in Appendix 1.

For nine product categories that were among the categories rated most highly on disgust (see Appendix 2) we also conducted an online survey among 153 U.S. adult consumers between the age of 18 and 81 (Mean = 36 years, 68% female). In this survey we examined whether national brands were indeed more strongly associated with the disgust inducing product categories than private label (store) brands. For each category, we asked respondents to indicate how closely each of two national brands (e.g. Pampers baby diapers, Huggies baby diapers) and each of two store brands (e.g. CVS baby diapers and Walgreens baby diapers) were associated

with the product category. Results show that across nine different product categories the national brands were indeed much more strongly associated with the product category than the store brands. Differences in the degree of association with the product category were highly significant ($p < .0001$) between the national brands and private label brands for all nine product categories. In line with our prediction, we will later test whether being national versus being a private label moderates the effect that disgust has on prices paid and basket composition.

Procedure

We randomly selected a “source item” for each transaction. This item was chosen from the 45 product categories for which we had a disgust rating (we omitted transactions that do not contain any products from these categories). We use the disgust rating of each source item’s corresponding product category to evaluate the composition of the baskets (we refer to the remaining items as “target” items). Randomly picking a source item ensures that selection of the source item does not introduce a correlation with the size of the basket.²

Results

As a preliminary analysis we divided the transactions into two groups according to the disgust rating of the source item. Consistent with previous literature categorizing products based on their level of disgust (Morales and Fitzsimons 2007), if the source item received a rating above five (out of 10) we identified that basket as “disgusting,” while the remaining baskets were

² Notice that baskets containing more items may have a higher probability of containing more disgusting items simply because of the size of the basket. Therefore simply comparing basket size and whether the basket contains a disgusting item introduces an obvious confound such that larger baskets will, on average, comprise more disgusting items and items with a higher disgust rating. Randomly selecting a representative item overcomes this confound. It is also conservative, as in many cases the representative item will not be the most disgusting item in the basket.

treated as “not disgusting.” This categorization yielded a sample of 3,134,942 transactions with a disgusting source item and 13,638,566 transactions in which the source item was not disgusting. Notice that the uneven distribution of transactions across these two samples simply reflects the category purchase frequencies (this is one of the advantages of randomly selecting a representative item). If customers purchased disgusting products more frequently then this subsample of transactions would have been larger. Reassuringly, there is no reason to believe that this uneven distribution affects the findings. While a more even distribution would reduce the standard errors of our test statistics, the sample sizes are so large that this is of little consequence.³

In table 1, we report the average number of items in the basket and the proportion of target items that are purchased at a discounted price (because it is an indicator of price search) for each of these two groups of transactions. When calculating the proportion of discounts on the target items, we restrict attention to baskets with at least one target item and one source item (omitting baskets with only a single item).

The findings reveal that when the source item was “disgusting” the basket size contained fewer total items (4.06 vs. 4.56, $t = 232$, $p < 0.01$) and a smaller proportion of discounts on the target items (19.2% vs. 22.6%, $t = 162$, $p < .001$). Not only did consumers choose fewer items, they also appeared to engage in less price search and paid relatively higher prices. These findings provide further evidence that disgust is associated with less consumer search.

The disgust rating is a continuous variable, varying between 1 and 10. Therefore, we can replicate our analysis by calculating the pairwise correlation between the disgust rating for the source items and our two dependent variables. The findings are reported in table 2. The

³ We will also present results in which we treat the disgust-rating as a continuous measure (tables 3 and 4). This analysis does not rely on the discrete categorization of the transactions into two samples.

correlations between disgust and basket size as well as between disgust and percentage of discounted items respectively are both negative and significant ($p < 0.01$).

Tables 1 and 2 about here

We also examined whether the effects of the source item's ability to induce disgust were moderated by the source item's label (brand). Recall that we predicted that because the private label brand is shared across multiple product categories it would tend to have a weaker association with the product category, and hence would have weaker effects on search. Approximately 20% of the source items carry the store's own private label brand (the remaining 80% have national brands). To investigate how this moderated the outcome we estimated separate OLS regressions for both dependent variables.⁴ The dependent variables were regressed on the following independent variables:

$$\alpha + \beta_1 \text{ Disgust Rating} + \beta_2 \text{ Private Label} + \beta_3 \text{ Disgust Rating} * \text{ Private Label} + \varepsilon$$

We anticipate that higher disgust ratings will be associated with smaller values for each of the dependent variables. This implies that β_1 will be negative in both models (number of items and percentage of discounted items). Private Label variable is a binary variable, which equals one if the source item carried the private label brand and zero if it carried a national brand. If the effect of Disgust Rating is indeed smaller when the source item is a private label brand (rather than a national brand) we expect β_3 to be positive.

The estimated interactions are consistent with our prediction. The Disgust Rating

⁴ For the *number of items* measure we also estimated a Poisson regression model. Reassuringly, the Poisson regression model reveals the same pattern of results.

coefficient (β_1) reveals a significant and negative main effect across both dependent variables. Higher disgust ratings on the source item are associated with smaller basket sizes and a smaller proportion of discounted items. The positive coefficients on the interaction term (β_3) confirm that these effects are smaller when the source item carries the store's private label brand. These findings are consistent with our interpretation that national brands are more uniquely associated with a disgusting product category and hence have stronger effects on consumers' search behavior than items with private label brands (which are shared across a wider range of categories).

Table 3 about here

These findings suggest an interesting corollary. If private label brands are less associated with a given product category, then we might expect that customers would exhibit a greater preference for private label items in categories that have higher disgust ratings. To investigate this possibility we compared the market share of private label items across the different product categories. In "disgusting" categories (those with a disgust rating above 5) the market share of private label items is 27.4%. This compares with 21.8% in categories with disgust ratings less than 5. The difference between these market shares is large and highly significant ($t = 221, p < 0.01$).

Alternative Explanations

To better understand the source of the association between the disgust rating of the source product and the composition of the rest of the basket we investigated two alternative explanations. First, it is possible that "disgusting" products such as diapers, sanitary napkins, and

gastrointestinal liquids are more likely to be purchased on an emergency basis, with customers making quick visits to the store to find individual items. This could contribute to smaller basket sizes for these products without requiring any effects of emotions on search. To investigate this possibility we re-estimated our findings using only baskets that have an above-median size (at least four items). The findings are reported in Appendices 3-5.

They reveal that all of the results continue to hold. In particular, if the source item has a higher disgust rating the basket size tends to be smaller and contains a lower proportion of discounted items (notice that the basket size effect survives *despite* censoring baskets with fewer than four items). The interaction with the Private Label variable also remains; the percentage of discounted items and basket size effects are both attenuated when the source item carries the retailer's private label brand. As a more general test we also re-estimated the percentage discount findings separately for every basket size between two and ten items. The relationship between the disgust rating of the source item and the percentage of items that are discounted holds for *each* of these basket sizes. We conclude that the findings are robust and do not appear to be attributable to customers making emergency purchases of disgusting items.

The second alternative explanation is more subtle and applies only to the findings regarding the percentage of items that are discounted. We earlier predicted and offered evidence that the disgust rating of the source product will affect not only how many items customers purchase, but also which items they purchase. Because items are discounted with different frequencies, it is possible that the relationship between the source item's disgust rating and the percentage of discounted items reflects customers purchasing different items, rather than differences in their search for low prices.

We can control for this possibility by using a common sample of target items. In

particular, there are 4,226 items that appear in 500 or more baskets with a “disgusting” source item *and* 500 or more baskets with a “not-disgusting” source item. For each item we separately calculated the percentage of times it was discounted in these two groups of baskets. In table 4 we report these proportions averaged across the 4,226 items. We continue to observe the same pattern of findings: 22.3% of the common target items in the basket are discounted when the source item is “disgusting” compared to 23.5% when it is not. The difference between these averages is highly significant. Because we use a common sample of items we ensure that this difference cannot be attributed to how frequently different items are discounted.

Table 4 about here

For completeness we also replicated this analysis according to whether the source item carries the private label brand (see table 4). The findings reveal that for this sample of common target items, the difference in the percentage of target items that are discounted only arises when the source item has a national brand. The difference disappears when the source item has the retailer’s private label brand.

Discussion

Our transaction data complement and extend our laboratory study by providing additional evidence that shopping for a disgusting item reduces customers’ search on the same shopping trip. This reduction in customer search is reflected in smaller baskets and a smaller proportion of discounted items. While the effect of emotions on consumer decisions has been thoroughly established in the lab (e.g. Lerner et al. 2004) and in small field studies (e.g. Argo Dahl and Manchanda 2005), to the best of our knowledge this study is the first to use a large scale data set

to demonstrate the substantive impact emotions have on a very large number of every day purchase decisions.

In addition, by examining the response to national versus store brands our results provide further insight into the role of disgust in affecting purchase decisions. Because national brands are often uniquely identified with a specific product category, whereas retailers' private label brands are shared across categories, we expected that consumer responses to buying a disgusting product would be weakened when buying private label brands. Our findings were consistent with this prediction; higher disgust ratings of the product category had a smaller effect on the composition of the transaction when the disgust inducing item carried the store's private label brand.

Findings from transaction data like these are always open to alternative interpretations. In particular, we cannot distinguish whether the effects result from changes in shopping behavior within a trip, or whether shoppers plan separate trips to purchase items with higher disgust ratings. The moderating role of private label brands is easier to reconcile with the effects occurring within a shopping trip. It seems unlikely that customers plan separate trips only when they are purchasing national brands. Further we find similar patterns of effects for larger as for smaller basket sizes and for a common sample of items.

We also caution that the transaction data was collected from brick and mortar stores where consumers have physical contact with products, and products may touch each other in the basket. Prior work on contagion (e.g. Morales and Fitzsimons 2007) suggests that products become tainted once they touch a disgusting item. If an emotionally neutral item is added to a basket containing a disgusting item, it too, could become disgusting through physical contact. However, contagion based explanations would predict that as these other products become

tainted, consumers would become *more* price sensitive for these items since being contaminated makes them less desirable. This, however, is inconsistent with the evidence that customers purchase a *smaller* proportion of discounted products.

While we acknowledge these potential limitations, we also recognize that the goal of this study was to complement the findings from study 1, which does not share the same limitations. By providing evidence from actual transactions we are able to extend our laboratory findings to a much larger range of product categories that vary in the extent to which they evoke disgust. Taken together, the laboratory study and the transaction data complement each other and play an important role in establishing the internal and external validity of our findings.

General Discussion

Research on consumer decision making often treats product choice as an independent, one shot decision. However, everyday purchase decisions do not occur in isolation. As Cavanaugh et al. (2007) suggest, during a single shopping trip involving multiple, sequential choices, the emotional consequences of one decision may act as incidental emotions for subsequent choices. Our research focuses on such interdependencies across purchases that may exist even though product choices are not functionally or consumptionally related but that occur during the same shopping trip. We establish that shopping for a product that induces specific emotions can significantly change how consumers shop for unrelated, neutral products.

In the laboratory, we simulate the sequential decisions consumers face in a single shopping trip. We induce emotional responses by asking consumers to examine everyday products just like they would if shopping for that product. Emotions induced during a single shopping trip can create both evaluative and behavioral responses. Prior research has established

unique effects of specific emotions on willingness to pay (e.g. Lerner et al. 2004, Argo, Dahl and Morales 2006, McGraw and Davis 2011), an evaluative response. In addition to examining such WTP responses, we also examine behavioral responses, and for the first time, demonstrate the effect emotions can have on search behavior. We build on prior research that established differences in WTP for two negative emotions that differed with respect to their associated appraisals and action tendencies, i.e. with disgust leading to lower and sadness leading to higher WTP (Lerner et al. 2004). Indeed when making choices in a subsequent purchase task, we find that when disgust was induced previously, consumers reported lower WTP compared to when sadness was induced previously. Importantly, however, we show that taking into account the effect these different emotions have on search behavior ultimately reveals a different pattern of results for prices paid in shopping settings than for WTP. We find that disgust, characterized by avoidant behavior, reduces search, while sadness, characterized by approach tendencies, increases search. In the highly controlled lab environment, we are also able to establish the mediating role of search in linking the effect of incidental emotions to prices paid, showing that the amount of search in which consumers engage, subsequently affects prices paid.

Importantly we also provide additional evidence using transaction data from a large number of actual purchases made by real consumers. Across a wide variety of disgust-inducing products and a large number of purchase incidents, we find significant effects on the size and composition of the shopping basket and prices paid. Furthermore, we show that these effects are not limited to products that evoke extreme levels of disgust but that having to buy even products perceived as only moderately disgusting can alter shopping behavior.

While the results found in the transaction data are open to alternative explanations, most critically self-selection, these concerns do not apply to the laboratory results. In the lab, products

to be purchased were mandated, remained identical across conditions, and participants knew the range of prices they could find with more search. Thus differences in cross-category purchases cannot be explained by heterogeneity in consumer preferences or differences in context. Taken together, the results of our laboratory experiment and transaction data provide convergent evidence of the relationship between emotions, search, and prices paid and highlight the important role that *search* plays for consumer choice.

We contribute to prior research that demonstrated the importance of search and consideration set formation on product choice (e.g. Hauser 1978, Moorman et al. 2004), showing that ignoring these mechanisms may lead to substantially different findings with regard to prices consumers pay and products they choose in the market place. By operating through this different, search driven mechanism, it is clear that the potential effects emotive purchases may have on consumer behavior are even greater than previously believed. Further, while prior research has demonstrated the effects of emotions on economic decisions in the lab and small field settings, here a large scale data set has been used for the first time to examine the effect of emotions in everyday consumption settings.

Implications and Future Research

Our research has a number of important implications for manufacturers and retailers making decisions on the pricing of products, the allocation of shelf space, and the organization of product categories. In particular, the effects on search and product choices found in our research have implications for pricing of and shelf space allocations for products that marketers know are frequently purchased along with emotive products either due to complementarity (e.g. sympathy cards to go with a sympathy flower bouquet) or due to physical closeness on the shelf (e.g. paper products placed proximate to cat litter). For example in terms of pricing, since products

purchased at the same time as disgust inducing products, are often subject to very little price search, firms may be able to charge higher prices in categories that are bought alongside emotive products.

One may presume that products that can trigger negative affective reactions may be infrequent and insignificant in real life. However, quite a number of product categories found in a grocery or convenience store are seen as at least moderately disgusting. In contrast, few grocery products per se evoke sadness. However, this does not necessarily imply that sadness is not evoked in the market place; for example, sadness may be induced through product packaging or store displays. Cause related promotions are ubiquitous in super markets (Frazier 2009). Drawing attention to causes such as breast cancer, leukemia, MS, AIDS, and other diseases that may have affected and claimed the lives of loved ones, may indeed trigger sadness during a normal store visit. If that is the case, marketers may want to find ways to strategically manage the extent to which products, on-product promotions, and category labels are affect-inducing and hence influence search.

Findings from the transaction data suggest that national brands may be more strongly associated with certain emotion inducing categories than store brands. Since that strong association with the category is something national brand manufacturers want, one way to manage emotions may be for manufacturers of national brands to strategically devise brand names that evoke emotions to a greater or lesser extent by highlighting or downplaying the product's association with the emotion. As mentioned before, the brand “Scoop Away,” which emphasizes the disgusting nature of cat litter, elicited greater feelings of disgust than the brand “Tidy Cat.” Similarly, retailers may strategically alter category labels (e.g. bathroom tissue versus toilet tissue, stomach medicine vs. anti-diarrheal medicine) to influence the extent to

which different emotions are evoked. Moreover retailers' growing interest in grouping assortments in terms of goal-derived categories (e.g. Morales et al. 2005, Lamberton and Diehl 2013) may offer greater flexibility than traditional taxonomic categories to heighten or dampen the extent to which affect is triggered in the retail environment. For example, even though toilet tissue normally induces disgust, when included in the category of "Slumber Party Necessities" along with sleeping bags, candy, and DVDs, rather than inducing disgust it may instead evoke excitement and anticipation as thoughts of the typical use of toilet tissue are replaced by mental images of TP-ing the neighbor's house.

In addition, our findings have important implications for marketing researchers. While open or closed ended WTP measures have been shown to be equivalent to more sophisticated elicitation methods (e.g. BDM) in collecting valid responses, these measures ignore the impact of search on purchase decisions. While this omission may not be relevant in certain categories (e.g. where a monopoly exists), in purchasing situations where categories are characterized by significant price and product dispersion, taking search into account may be crucial in predicting consumers' choices and purchase intentions.

Building on prior research, our work has focused exclusively on negative emotions, in particular sadness and disgust. Obviously there are many products and/or purchasing environments that induce other, specific emotions, both positive and negative in valence, (e.g. pride, contentment, fear, guilt). The effects of such emotions and their respective appraisals and action tendencies on behavioral responses such as search warrant closer examination as well. Further, we have focused on subsequent decisions that themselves induce lower intensity and neutral responses (e.g. choosing a neutral product like sunscreen). Also, particularly in the laboratory study, we have only examined the effect of an emotion inducing product on two other

neutral decisions. Future research may be interested in examining a larger number of subsequent decisions and may also want to investigate subsequent decisions that themselves induce stronger or different emotional reactions. Of particular interest may be to examine subsequent decisions that differ from earlier decisions in terms of the valence and/or intensity of the emotion they induce. For example, it may be the case that consumers have to purchase one product that induces disgust, a second product that induces fear, and a third product that induces contentment all on the same shopping trips. Considering how these decisions may interact with one another and what the cumulative impact on shopping behavior might be would enhance our understanding of this research area.

Another interesting question future research may want to investigate is for how long emotive product decisions affect subsequent decisions. As emotions are typically short-lived (Fredrickson 2000), it may be the case that only decisions which immediately follow the emotion induction are affected. However, as Dhar, Huber and Khan (2007) show, the act of making a purchase can sometimes lead to “shopping momentum” that increases the likelihood of making additional purchases on the same trip. Their findings could imply that emotions that extend search and encourage choices initially may build a similar momentum, thus influencing decisions further down the road even after the emotion itself has receded. As such, future research may want to further examine to what extent emotions induced during a shopping trip do or do not have enduring effects.

Our research suggests a number of avenues for future investigations. Nevertheless, to our knowledge, this is the first research that examines the relationship between emotions, appraisal tendencies, and consumer search. As such, this work contributes to the emotion literature by demonstrating that incidental affect induced by shopping for a product can systematically alter

consumer search behavior during a given shopping trip. Our findings further contribute to the literature by distinguishing between evaluative and behavioral responses to incidental emotions. By examining search as a behavioral response, we contribute a novel mechanism that enhances our understanding of the effects emotions have on consumer behavior. Further, we demonstrate theoretically and substantively important differences between related, prevalent marketing variables such as WTP and prices paid, suggesting that the effects of emotions on economic decision making are even more complex than previously believed. Future work should continue this line of investigation and consider both the individual as well as the interactive effects of shopping for products that induce specific emotions.

Figure 1

Study 1: Example of Search Condition (Sunscreen Trial)

Sunscreen

Please click on a picture for more information and to choose the product



Panel A: Example product assortment



Bullfrog Surfer Formula Gel Sunblock

SPF 36. High performance, ultra sweatproof sunscreen bonds to skin on contact and won't run into your eyes and sting. Formula doesn't leave a greasy residue which could adversely affect your grip.

5.0 oz

\$ 3.50

Choose this product

Return to selection

Panel B: Example of information provided when a product was examined

Table 1**Study 2: Differences in Basket Size and Composition - Discrete Analysis**

	Source Item Not Disgusting	Source Item Disgusting	Difference
Number of items in each basket	4.5617 (0.0009)	4.0607 (0.0018)	0.5010** (0.0022)
Sample size	13,638,566	3,134,942	
Percentage of discounted target items	22.60% (0.01%)	19.19% (0.02%)	3.42%** (0.02%)
Sample size	11,923,043	2,612,342	

Standard errors are in parentheses. The difference in sample sizes for the two dependent variables reflects the omission of transactions that only contain a single item (the source item) when calculating the percentage of discounted target items. ** Significantly different from zero, $p < 0.01$.

Table 2**Study 2: Differences in Basket Size and Composition – Continuous Analysis**

	Correlation with Disgust Rating of the Source Item	Sample Size
Number of items in each basket	-0.067**	16,773,508
Percentage of discounted target items	-0.039**	14,535,385

Standard errors are in parentheses. The difference in sample sizes for the two dependent variables reflects the omission of transactions that only contain a single item (the source item) when calculating the percentage of discounted target items. ** Significantly different from zero, $p < 0.01$.

Table 3
Study 2: Effect of Disgust Rating and Branding on Basket Composition

	Number of Items in Each Basket	Percentage of Discounted Target Items
Intercept	5.0781** (0.0024)	0.25330** (0.00023)
Disgust Rating	-0.1820** (0.0008)	-0.01050** (0.00007)
Private Label	-0.4134** (0.0052)	-0.03527** (0.00050)
Disgust Rating * Private Label	0.0244** (0.0016)	0.00732** (0.00015)
Adjusted R ²	0.01	0.002
Sample size	16,773,508	14,535,385

Standard errors are in parentheses. The difference in sample sizes reflects the omission of transactions that only contain a single item (the source item) when calculating the percentage of discounted target items. ** Significantly different from zero, $p < 0.01$.

Table 4
**Study 2: Differences in the Percentage of Discounted Items
When Holding the Target Items Fixed**

	Not Disgusting Source Item	Disgusting Source Item	Difference
All Source Items	23.53% (0.34%)	22.32% (0.33%)	1.22%** (0.04%)
Private Label Source Items	23.18% (0.34%)	23.13% (0.34%)	0.06% (0.05%)
National Brand Source Items	23.60% (0.35%)	22.04% (0.33%)	1.56%** (0.05%)
Sample size	4,226	4,226	4,226

The difference in these proportions is calculated using a paired sample t-test. Standard errors are in parentheses. ** Significantly different from zero, $p < 0.01$.

Appendix 1 – Disgust Ratings of Categories Used in Study 2

Category	Disgust Rating
Cat / dog litter	7.24
Gastrointestinal liquids	6.21
Cat food	6.12
Diapers	6.01
Dog food	5.39
Internal analgesics	5.38
Gastrointestinal tablets	5.22
Food & trash bags	5.16
Sanitary napkins / tampons	5.14
Adult incontinence	5.03
Pet supplies	4.12
Toilet tissue	3.87
Charcoal	3.71
Sponges & scouring pads	3.64
Charcoal lighter fuel	3.61
Bleach	3.57
Household cleaner	3.29
Cough drops	3.13
Cleaner cloths	3.01
Moist towelettes	2.9
Dish detergent	2.86
Baby accessories	2.79
Cold tablets	2.76
Deodorant	2.62
Hair accessories	2.59
Razors	2.56
Foil pans	2.55
Air fresheners	2.28
Cotton balls / swabs	2.27
Gloves	2.24
Foil & wraps	2.19
Batteries	2.19
Children's art supplies	2.17
Paper towels	2.09
Fabric softener liquid	2.08
Candles	2.04
Laundry detergent	2.00
Facial tissue	1.99
Vitamins	1.98
Light bulbs	1.95
Soap	1.93
Writing instruments	1.85
Paper napkins	1.69
Cups & plates	1.65
Shampoo	1.62

**Appendix 2 – Degree of Association Between Brand and Product Categories
Used in Study 2**

	National Brand Average	Store Brand Average	Effect of Brand*
Cat litter	9.21	2.73	F(1, 152) = 1377.42
Anti-diarrhea medicine	9.01	4.60	F(1, 152) = 331.26
Cat food	9.53	2.71	F(1, 152) = 2004
Diapers	9.84	4.01	F(1, 152) = 983.65
Dog food	9.27	2.66	F(1, 152) = 1615.73
Trash bags	9.51	3.45	F(1, 152) = 935.61
Maxi pads	7.82	2.55	F(1, 152) = 640.75
Tampons	9.53	4.20	F(1, 152) = 628.21
Adult incontinence	8.20	3.93	F(1, 152) = 396.53;

How closely is Brand X associated with Category Y? (10 point scale, not at all associated, highly associated)

* Differences in associations with the product category between national brands and store brands were significant at the $p < .0001$ level for all 9 categories.

Appendix 3
**Study 2: Differences in Basket Size and Composition for Baskets with at Least Four Items-
Discrete Analysis**

	Source Item Not Disgusting	Source Item Disgusting	Difference
Number of items in each basket	6.7623 (0.0013)	6.5037 (0.0028)	0.2585** (0.0032)
Sample size	7,208,952	1,427,878	
Percentage of discounted target items	22.52% (0.01%)	19.36% (0.02%)	3.15%** (0.02%)
Sample size	7,208,952	1,427,878	

In this table we limit attention to baskets containing four or more items. Standard errors are in parentheses.

** Significantly different from zero, $p < 0.01$.

Appendix 4
**Study 2: Differences in Basket Size and Composition for Baskets with at Least Four Items-
Continuous Analysis**

	Correlation with Disgust Rating of the Source Item	Sample Size
Number of items in each basket	-0.035**	8,636,830
Percentage of discounted target items	-0.039**	8,636,830

In this table we limit attention to baskets containing four or more items. Standard errors are in parentheses. ** Significantly different from zero, $p < 0.01$.

Appendix 5
Study 2: Effect of Disgust Rating and Branding on Basket Composition
Baskets with at Least Four Items

	Number of Items in Each Basket	Percentage of Discounted Target Items
Intercept	7.0389** (0.0034)	0.27716** (0.00024)
Disgust Rating	-0.0960** (0.0011)	-0.01362** (0.00008)
Private Label	-0.2294** (0.0075)	-0.05645** (0.00053)
Disgust Rating * Private Label	0.0033** (0.0023)	0.00927** (0.00017)
Adjusted R ²	0.002	0.01
Sample size	8,636,830	8,636,830

In this table we limit attention to baskets containing four or more items. Standard errors are in parentheses. ** Significantly different from zero, $p < 0.01$.

References

- Ailawadi, Kusum L., Scott A. Neslin, Karen Gedenk (2001), "Pursuing the Value-Conscious Consumer: Store Brands versus National Brand Promotions," *The Journal of Marketing*, 65 (1), 71-89.
- Agrawal, Nidhi and Adam Duhachek (2010), "Emotional Compatibility and the Effectiveness of Anti-Drinking Messages: A Defensive Processing Perspective on Shame and Guilt," *Journal of Marketing Research*, 47 (2), 263-273
- Argo, Jennifer J., Darren W. Dahl, and Rajesh V. Manchanda (2005), "The Influence of a Mere Social Presence in a Retail Context," *Journal of Consumer Research*, 32 (2), 207-212.
- , ———, and Andrea C. Morales (2006), "Consumer Contamination: How Consumers React to Products Touched by Others," *Journal of Marketing*, 70 (2), 81-94.
- Becker, Gordon M., Morris H. DeGroot, and Jacob Marschak (1964), "Measuring Utility by a Single-Response Sequential Method," *Behavioral Science*, 9:3 (1964:July), 226-232.
- Black, Donald W., Susan Repertinger, Gary R. Gaffney, and Janelle Gabel (1998), "Family History of Psychiatric Comorbidity in Persons with Compulsive Buying: Preliminary Findings," *American Journal of Psychiatry*, 155(7), 960-963.
- Cavanaugh, Lisa A. (2011), "All the Single Ladies (and Men, too): How Partnership Status and Relationship Reminders Change Indulgent Choice", Working Paper, University of Southern California.
- , James R. Bettman, Mary Frances Luce, and John W. Payne (2007), "Appraising the Appraisal-Tendency Framework," *Journal of Consumer Psychology*, 17 (3), 169–173.
- Christenson, Gary. A., Ronald J. Faber, M. de Zwaan, M., N.C. Raymond, S.M. Specker, M.D. Ekern, T.B. Mackenzie, R.D. Crosby, S.J. Crow, E.D. Eckert, M.P. Mussell, and J.E. Mitchell (1994), "Compulsive Buying: Descriptive Characteristics and Psychiatric

- Comorbidity," *Journal of Clinical Psychiatry*, 55(1), 5-11.
- Cohen, Taya R., Wolf, Scott T., Panter, A. T. and Insko, Chester A (2011), "Introducing the GASP scale: A new measure of guilt and shame proneness," *Journal of Personality and Social Psychology*, 100(5), 947-966.
- Cryder, Cynthia E., Jennifer S. Lerner, James J. Gross and Ronald E. Dahl (2008), "Misery Is Not Miserly: Sad and Self-Focused Individuals Spend More," *Psychological Science*, 19 (6), 525-530.
- Dhar, Ravi, Joel Huber, and Uzma Khan (2007), "The Shopping Momentum Effect," *Journal of Marketing Research*, 44 (3), 370-378.
- Diehl, Kristin (2005), "When Two Rights Make A Wrong: Searching Too Much in Ordered Environments," *Journal of Marketing Research*, 42 (3), 313–322.
- Faber, Ronald J. and Gary A. Christenson (1996), "In the Mood to Buy: Differences in the Mood States Experienced by Compulsive Buyers and Other Consumers," *Psychology and Marketing*, 13(8), 803-819.
- The Food Institute (2004), *The Food Institute's Food Industry Review 2004*. Elmwood Park, NJ: The Food Institute.
- Frazier, Mya (2009), "Seeing Pink – When did consumption become a virtue?," *Delta Sky Magazine*, October, 58-65.
- Fredrickson, Barbara (2000), "Positive emotions", in: *Handbook of positive psychology*, Oxford University Press, 120 – 134.
- Garg, Nitika, J. Jeffrey Inman, and Vikas Mittal (2005), "Incidental and Task-Related Affect: A Re-Inquiry and Extension of the Influence of Affect on Choice," *Journal of Consumer Research*, 32 (1), 154-159.

- Goldsmith, Kelly, Eunice Kim and Ravi Dhar (2012). "When Guilt Begets Pleasure: The Positive Effect of a Negative Emotion," *Journal of Marketing Research*, 49, 6, 872-881.
- Hauser, John R. (1978), "Testing the Accuracy, Usefulness, and Significance of Probabilistic Choice Models: An Information-Theoretic Approach," *Operations Research*, 26 (May-June), 406-421.
- Kahneman, Daniel, Jack L. Knetsch and Richard H. Thaler (1991), "Anomalies: The Endowment Effect, Loss Aversion, and Status Quo Bias," *The Journal of Economic Perspectives*, 5 (1), 193-206.
- Keltner, Dacher, Phoebe C. Ellsworth, and Kari Edwards (1993). Beyond simple pessimism: Effects of sadness and anger on social perception. *Journal of Personality and Social Psychology*, 64, 740 - 752.
- Lazarus, Richard S. (1991), "Progress on a Cognitive-Motivational- Relational Theory of Emotion," *American Psychologist*, 46 (8), 819-834.
- Lerner, Jennifer D. and Dacher Keltner (2000), „Beyond valence: Toward a model of emotion-specific influences on judgment and choice," *Cognition and Emotion*, 14 (4), 473-493.
- and ——— (2001), "Fear, Anger, and Risk," *Journal of Personality and Social Psychology*, 81 (1), 146-159.
- , Deborah A. Small, and George Loewenstein (2004), "Heart Strings and Purse Strings. Carryover Effects of Emotions on Economic Decisions," *Psychological Science*, 15 (5), 337–341.
- McGraw, A. Peter and D. Davis (2011), "Can't put a price on love: The sacred, spendthrift pursuit of secular products," Working Paper, University of Colorado.
- Mick, David Glen and Michelle DeMoss (1990), "Self-Gifts: Phenomenological Insights from

- Four Contexts," *Journal of Consumer Research* 17 (3), 322-332.
- Miller, Klaus M., Reto Hofstetter, Harley Krohmer, and Z. John Zhang (2011), "How Should Consumers' Willingness to Pay Be Measured? An Empirical Comparison of State-of-the-Art Approaches," *Journal of Marketing Research*, 48 (February), 172-184.
- Milliman, Ronald E. (1982), "Using Background Music to Affect the Behavior of Supermarket Shoppers," *The Journal of Marketing*, Vol. 46 (3), 86-91.
- Moorman, Christine, Kristin Diehl, David Brinberg, and Blair Kidwell (2004), "Subjective Knowledge, Search Locations, and Consumer Choice," *Journal of Consumer Research*, 31 (3), 673-680.
- Morales, Andrea, Barbara E. Kahn, Leigh McAlister, and Susan M. Broniarczyk (2005), "Perceptions of Assortment Variety: The Effects of Congruency between Consumers' Internal and Retailers' External Organization," *Journal of Retailing*, 81 (2), 159-169.
- , and Gavan J. Fitzsimons (2007), "Product Contagion: Changing Consumer Evaluations Through Physical Contact with "Disgusting" Products," *Journal of Marketing Research*, 44 (2), 272-283.
- Morewedge, Carey. K., Shu, Lisa L., Gilbert, Daniel T., & Wilson, Timothy. D. (2009). "Bad riddance or good rubbish? Ownership and not loss aversion causes the endowment effect," *Journal of Experimental Social Psychology*, 45, 947-951.
- Poynor, Cait and Kristin Diehl (2011), "The Effects of Benefit and Feature-Based Assortment Structures on Similarity Perceptions and Strength of Preference" Working Paper, University of Pittsburgh.
- Hayes (2013), *Introduction to mediation, moderation, and conditional process analysis*. New York: The Guilford Press. .

- Raghunathan, Rajagopal and Michel Tuan Pham (1999), "All Negative Moods Are Not Equal: Motivational Influences of Anxiety and Sadness on Decision Making," *Organizational Behavior and Human Decision Processes*, 79 (1), 56-77.
- Ramanathan, Suresh and Patti Williams (2007), "Immediate and Delayed Emotional Consequences of Indulgence: The Moderating Influence of Personality Type on Mixed Emotions," *Journal of Consumer Research*, 34 (2), 212-223.
- Rick, Scott, Beatriz Pereira, and Katherine Burson (2014), "The Benefits of Retail Therapy: Making Purchase Decisions Reduces Residual Sadness," *Journal of Consumer Psychology*, forthcoming.
- Rozin, Paul, Jonathan Haidt, and Clark McCauley (1993), "Disgust," in *Handbook of Emotions*, Michael Lewis and Jeannette M. Haviland, eds. New York: Guilford Press, 575-94.
- , Linda Millman, and Carol Nemeroff (1986), "Operation of the Laws of Sympathetic Magic in Disgust and Other Domains," *Journal of Personality and Social Psychology*, 50 (4), 703-712.
- Schwarz, Norbert (1998), "Warmer and More Social: Recent Developments in Cognitive Social Psychology," *Annual Review of Sociology*, 24, 239-264.
- Smith, Craig A. and Phoebe C. Ellsworth (1985), "Patterns of Cognitive Appraisal in Emotion," *Journal of Personality and Social Psychology*, 48 (4), 813-38.
- Urbany, Joel E., Peter R. Dickson, Rosemary Kalapurakal (1996), "Price Search in the Retail Grocery Market," *The Journal of Marketing*, 60 (2), 91-104.
- Zhao, Xinshu, Lynch, John G. and Chen, Qimei (2010), "Reconsidering Baron and Kenny: Myths and Truths About Mediation Analysis," *Journal of Consumer Research*, 37 (August), 197-206.

Zhu, Meng (2012), *Essays on Conservation and Waste in Consumption*, Dissertation, Carnegie Mellon University.