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This research demonstrates the strong influence of disgust in a consumer context. Specifically, it shows how consumer evaluations may change in response to physical contact with products that elicit only moderate levels of disgust. Using evidence from six studies, the authors develop a theory of product contagion, in which disgusting products are believed to transfer offensive properties through physical contact to other products they touch, thus influencing evaluations.

## Product Contagion: Changing Consumer Evaluations Through Physical Contact with “Disgusting” Products

Recent research has begun to examine the influence of discrete emotions on consumer behavior (Dahl, Honea, and Manchanda 2005; Dahl, Manchanda, and Argo 2001; Luce 1998; Nowlis, Mandel, and McCabe 2004; Raghunathan and Pham 1999; Ramanathan and Williams 2007). However, with one notable exception (Lerner, Small, and Loewenstein 2004), little attention has been directed toward the emotion of disgust experienced in a consumer context. It might be assumed that feelings of disgust are not a major concern for most consumers. However, in a survey of 140 consumers, we found that six of the top-ten-selling nonfood supermarket items (as defined by *The Food Institute’s Food Industry Review 2004*; Food Institute 2004) elicit feelings of disgust. For example, trash bags, cat litter, and diapers, all of which are frequently purchased common household products, received a mean disgust rating of five or higher on a ten-point scale. These products were not alone in eliciting such responses; the survey also revealed that many other top-selling food and nonfood supermarket items, such as mayonnaise, shortening and oil, cigarettes, and feminine napkins, received high disgust ratings. This suggests that rather than feelings of disgust being a rare occurrence in the marketplace, consumers are likely to experience them regularly on routine shopping trips. The goal of this research is to examine consumer reactions to these disgust-inducing

products. To do this, we build on work in psychology (Rozin, Millman, and Nemeroff 1986) and anthropology (Frazer [1890] 1959; Tylor [1871] 1974) on social contagion and examine how consumer evaluations may change in response to physical contact with other products that elicit only moderate levels of disgust.

Specifically, we consider the case of disgusting products that come in contact with other consumer packaged goods. In doing so, we develop a theory of product contagion, in which offensive properties of disgusting products are believed to transfer to other products through physical contact. This transfer of properties influences subsequent consumer responses and evaluations. These beliefs are not rational; microbial contamination cannot occur between two new products in separate packages. Nonetheless, product contagion often results in strong feelings of contamination that lead to lower evaluations for the products that are considered “contaminated.”

Beyond showing that contamination effects commonly exist in a consumer context, we also provide insights into the underlying process. Although prior work on contagion has been unable to distinguish between a true contamination process and one based on associations, we argue that product contagion runs deeper than simply establishing negative associations between disgusting products and the items they touch. Rather, it demonstrates that consumers believe that disgusting products are able to contaminate other products by transferring their offensive properties on contact. The perceived contamination is not short lived; it produces enduring changes in how consumers respond to and evaluate contaminated products. Even when observed contact is brief and consumers are under cognitive load—as many are when shopping—product contagion still leads to genuine changes that are long lasting and may influence future choices.

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In addition to supporting an underlying contamination process, our work demonstrates that perceived contact between products is enough to produce contagion effects. Previous research has argued that actual physical contact must take place for contamination to occur, but our results suggest that as long as consumers believe that two objects have come in contact, contamination follows. This finding extends the applicability of previous work on contagion because it suggests that contamination can occur between consumer packaged goods that simply rest against each other on a shelf or in a grocery cart, provided that people believe that there has been contact between the products inside.

However, although perceived contact is enough to trigger contagion effects, it appears that consumers also have natural defenses that prevent them from being overwhelmed by perceptions of contamination. Specifically, contrary to prior work on contagion, we find that product contagion occurs only when consumers can visualize contact between the two products and when one of the products elicits disgust. For example, consumers do not believe that contamination takes place when products are in opaque rather than transparent packages, because they cannot see the product. Similarly, if a product induces other non-disgust-related negative feelings, such as frustration or anger, no contamination occurs because unlike disgust, these feelings are not believed to possess properties that can be transferred.

### DISGUST

Previous research has defined disgust as “a revulsion at the prospect of (oral) incorporation of an offensive substance” (Rozin and Fallon 1987, p. 23; see also Angyal 1941). This is not to say that people experience disgust only toward ingestible objects, but rather it emphasizes the strong link between objects having some form of physical contact with their bodies and feelings of disgust. Thinking about touching or even being near certain objects is often enough to evoke disgust. As a basic emotion, disgust results in several characteristic responses: a distinct facial expression of closed nostrils and an open mouth (Ekman and Friesen 1975; Izard 1971), an attempt to get away from the disgusting object, a physiological response of nausea, and an emotional state of revulsion. Together, these responses constitute the instant reaction people have to try to distance themselves from objects that cause disgust.

Although people and cultures differ in the objects that elicit disgust, usually disgusting substances are animal in nature or origin (Angyal 1941; Rozin and Fallon 1981), such as feces, bodily products, human and animal parts, or insects and worms. Regardless of which specific objects people find disgusting, however, the effects of these objects are often the same. Disgusting objects are believed to possess contaminating properties that lower the value of other objects with which they have contact (Rozin and Fallon 1987). For example, when disgusting objects come in contact with food, people no longer believe that the food is edible. In many cases, this reaction is appropriate; for example, contact with cockroaches often results in microbial contamination. However, it appears that people take this natural distancing reaction from contact with disgusting objects and generalize it to contexts in which it does not apply.

In recent work examining the effect of emotions on economic transactions, Lerner, Small, and Loewenstein (2004) find that when people feel disgusted, they seem to behave in ways that suggest that they believe that everything around them is tainted. When participants were primed with disgust, they had significantly lower selling prices and buying prices than those given a neutral prime. It appeared that experiencing disgust made people both eager to get rid of their “tainted” items and reluctant to obtain any new items. Despite these strong effects, people were unaware that their feelings of disgust had any influence on their subsequent economic decisions.

### *Disgust and Contagion*

Building on the general notion that disgusting substances contaminate other people and objects through contact, work in social contagion has specifically examined the underlying beliefs that cause such responses. Anthropologists have long discussed a series of laws of sympathetic magic, or broad theories about how the world works. These laws not only influence how people think but also form the basis for many customs and rituals in primitive cultures. Tylor ([1871] 1974) first proposed these laws, and Frazer ([1890] 1959) and Mauss ([1902] 1972) both built on prior work to develop the conceptual framework. One of the central laws of sympathetic magic is referred to as the “law of contagion.”

The law of contagion argues that objects or people can affect each other merely by touching. The law reasons that when a source (either a person or an object) is in physical contact with a target (a person or an object), the source passes some or even all of its properties to the target it is touching. Because the source is believed to transfer a contagious entity or “essence” to the target on contact, the properties remain part of the target even after they are no longer touching. This is why the law is often characterized as “once in contact, always in contact” (Frazer [1890] 1959).

Rozin, Millman, and Nemeroff (1986) first tested the law of contagion in the realm of disgust to show that these contagion beliefs are not limited to primitive cultures but operate in Western cultures as well. They found that a drink touched briefly by a sterilized cockroach became undesirable, as did a laundered shirt previously worn by a disliked person. Similarly, Rozin and colleagues (1989) showed that people gave lower ratings to a sweater that formerly belonged to a person they disliked. Notably, participants in Rozin, Millman, and Nemeroff’s (1986) study often could not verbalize or acknowledge their contagion belief or resisted stating it because it seemed foolish or unacceptable.

Although it is clear that contagion beliefs influence behavior in both primitive and advanced societies, it is still unclear how they became so prevalent. Because contact between objects is often how true microbial contamination occurs, a biological view suggests that contagion beliefs have adaptive value and could have originated as a form of protection against true physical contamination. Research has shown that contagion effects exist only for people above the age of seven because this is the age when people begin to understand higher-level ideas of matter and germs/microbes (Fallon, Rozin, and Pliner 1984; Rozin, Fallon, and Augustoni-Ziskind 1985). Thus, it appears that knowledge of how contamination really works is necessary for

people to demonstrate contagion effects. This suggests that the idea of contagion and contamination is not inherently irrational but simply misapplied to contexts in which real contamination is not possible.

### *Product Contagion*

Previous work in contagion indicates that offensive substances are able to contaminate other objects through direct physical contact with them. We extend this idea to develop a theory of product contagion, in which disgusting products are able to influence consumer evaluations through contact with other products. We also establish that contagion effects are not simply the result of negative associations but that people believe that disgusting objects transfer general and/or specific offensive properties on contact, thus contaminating the things they touch. Prior work has established the link between contact with disgusting objects and lower evaluations, but it has not established whether feelings of contamination or negative associations are the underlying cause of such responses.

If contamination is responsible for contagion effects, people should experience greater feelings of contamination when they hold a disgusting product than when they simply observe it on a store shelf or in a grocery basket. We conducted a pretest to examine this idea, in which participants either carried a disgusting product in its protective packaging back to their seats, thus touching the product, or looked closely at the product but did not touch it before answering a survey. Consistent with contagion beliefs that properties from one object transfer to another object on contact, the results of the pretest showed that when consumers had contact with the disgusting product, they reported feeling more "dirty," "gross," "revolted," and "disgusted" (Cronbach's  $\alpha = .87$ ;  $M = 4.65$ ) than when they were looking at the product but not touching it ( $M = 3.00$ ;  $F(1, 18) = 4.52, p < .05$ ). This suggests that physical contact with disgusting objects leads consumers to experience greater feelings of contamination.

If consumers feel contaminated by touching disgusting products, they may also infer that the same contamination process occurs between products. Specifically, when a disgusting source product is in contact with a target product, consumers may believe that the source product has passed some or all of its offensive properties to the target product, thus contaminating it. As a result, consumer evaluations of the target product would be significantly lower. Because the target product is believed to be contaminated with offensive properties, the drop in evaluation should not be temporary but should reflect a long-lasting, genuine change in consumer responses.

Although we propose that contamination causes these changes, an alternative mechanism for product contagion could be a simple spreading of negative associations between source and target products. In other words, objects that people find negative, but not necessarily disgusting, could also lead to lower evaluations on contact. For example, a product that elicits irritation could cause products it touches to be evaluated more negatively. However, if product contagion effects are driven by a process of perceived contamination, contagion effects should occur uniquely for products that elicit disgust and not for objects that elicit

emotions not related to an experience that is interwoven with the physical transfer of microbes or bacteria. As a result, the law of contagion predicts that consumers will not lower their evaluations of target objects touched by source objects that cause people to feel angry, frustrated, or just negative in general, but not disgusted.

If consumers evaluate products as though they believe that physical contact results in a transfer of properties from one product to another, products with specific attributes that people find disgusting should transfer those same attributes to the target products they touch. For example, people who find fat disgusting would believe that a fattening product transfers its fat content to a target product on contact. These consumers would view the target product as not only less desirable in general but also higher in fat. However, if the product contagion process is based on negative associations, the transfer of a specific attribute should not occur; contagion effects should be limited only to general evaluations but not to specific attributes.

In addition to establishing contamination as the driving force behind contagion effects, we propose that only perceived contact between two products is necessary. Direct, physical contact is not needed. Previous evidence for contagion effects in modern cultures has resulted from offensive objects physically touching other objects. Although in many cases disgusting objects were sterilized and incapable of transferring any offensive properties, direct physical contact between the objects still occurred (Rozin, Markwith, and Nemeroff 1992). To examine whether perceived contact alone leads to contagion, we study whether contagion effects also occur between products that do not physically touch. As long as consumers perceive the products as touching, they will respond as though the products are able to transfer their properties to each other.

The distinction between actual and perceived contact is relevant in a marketing context. We demonstrate that disgusting products are able to contaminate other products and lower consumer evaluations of them when their packages are touching on a shelf display or in a shopping cart. Although product packaging makes microbial contamination impossible, when consumers see the product packages in contact with each other, they react as though the products themselves are actually touching.

If perceived contact drives contagion effects, factors that enhance (reduce) the idea of products touching each other will magnify (dampen) negative product contagion effects. The type of package is one factor that influences the ability of consumers to visualize products in contact with each other. Prior work in packaging shows that incorporating visual imagery into a product package is beneficial because it elicits imagery processing (MacInnis and Price 1987). This suggests that for clear packages that reveal the products inside, consumers will spontaneously imagine how the products look, taste, and feel. This spontaneous imagination may have many positive effects. However, if such imagery processing increases perceived contact, the likelihood of product contagion also increases. Therefore, we expect that there will be greater contagion effects when products are displayed in clear packages and smaller contagion effects when products are displayed in opaque or translucent packages.

*STUDY 1: DO DISGUSTING PRODUCTS  
CONTAMINATE OTHER PRODUCTS?*

The goal of Study 1 is to show that people respond negatively when products come in contact with disgusting products. Because the law of contagion suggests that disgusting products are believed to pass their offensive properties on contact, when consumers observe disgusting products touching other products, they should believe that the other products are also contaminated and therefore are less desirable. We test this idea in the context of consumer packaged goods to provide support for the idea of product contagion while eliminating the possibility of microbial contamination and removing any rational basis for changes in product evaluations.

Study 1 and all the subsequent studies follow the same overall paradigm. Participants observe several products in a grocery cart or on a store shelf, with the focus being on two products: a source product that elicits disgust and a neutral target product. When the source product is positioned next to but is not touching the target product, contamination does not occur, and evaluations of the target product remain unchanged. However, when the source product is in direct physical contact with the target product, the source product is believed to transfer its offensive properties to the target product, thus lowering consumer evaluations of it.

Because of the strong link between disgust and contact with a person's body, we expect that product contagion effects will be stronger for products that have closer physical contact with the body and weaker for products that have less direct contact (Angyal 1941; Rozin and Fallon 1987). To test this idea, in Study 1, we vary whether the target item is a consumable product (cookies) versus a nonconsumable product (notebook paper) because oral incorporation is thought to be the closest form of contact an object can have with the body.

Finally, we measure evaluations of the nontarget product on the other side of the target product to ensure that contagion effects do not influence evaluations of other products in the basket but are limited only to the target product. If negative associations drive responses, people experiencing disgust will decrease evaluations of all the products in the basket. However, if a contamination process is occurring, the lower evaluations will be reserved only for the products in contact with the source and will not transfer to the surrounding products.

*Participants, Stimuli, and Procedure*

Ninety-five undergraduate students participated in Study 1, a 2 (package contact: nontouching versus touching)  $\times$  2 (target product: cookies versus notebook paper) between-subjects design. On entering the classroom in which the study was being administered, each participant was given a packet with instructions for the study. On the first page, participants were told that before answering any questions, they were to go to the front of the room to look at a shopping cart containing several items. They were told to look over the items carefully because they would be answering questions about the items in the cart when they returned to their seats.

Regardless of condition, all participants observed four items in the shopping cart. The products were arranged in a straight line with all the labels facing out toward the partici-

pants. All participants saw the same source product, feminine napkins (Stayfree), and the same two nontarget products, laundry detergent (Tide) and breakfast cereal (Cheerios). However, the target product differed across conditions. For half of the participants, the target product was a box of chocolate chip cookies (no brand name, in a transparent package), and for the other half, the target product was a package of notebook paper (no brand name, in transparent wrapping).

The only difference between contact conditions was whether the target product was touching the source product. In the touching condition, the feminine napkins (the source product) were resting slightly on the target product (cookies versus notebook paper), and the other two products were positioned on either side of them with a six-inch space separating each from the source and target products. In the nontouching condition, there was a six-inch space separating the source and target product, and the other two products were six inches from them on either side.

After looking over the items in the shopping cart, participants returned to their seats and rated how much they would like to try/use the target product they just saw in the shopping cart on a scale from 1 ("not at all") to 10 ("very much"). In addition, participants rated the quality of the target product and the nontarget product that was located to the immediate right of the target product (laundry detergent) on a scale from 1 ("very low") to 10 ("very high").

*Results*

The results indicate main effects of both contact ( $F(1, 91) = 11.06, p < .005$ ) and product category ( $F(1, 91) = 21.57, p < .001$ ) on trying/using the target product. In the nontouching condition, regardless of whether the target product was consumable, participants indicated a greater desire to try/use the product ( $M_{\text{nontouching}} = 6.88$ ) than when the target and source products were touching ( $M_{\text{touching}} = 5.47$ ). In general, participants also wanted to try the cookies ( $M_{\text{cookies}} = 7.15$ ) more than they wanted to use the notebook paper ( $M_{\text{paper}} = 5.20$ ). However, contrary to our prediction, the results did not reveal an interaction between contact and product category on desire to try/use the target product ( $F < 1$ ).

The same pattern of results also holds true for quality of the target product. There was a main effect of contact on quality of the target product; participants indicated higher quality in the nontouching condition ( $M_{\text{nontouching}} = 6.99$ ) than in the touching condition ( $M_{\text{touching}} = 5.34; F(1, 91) = 20.22, p < .001$ ). Again, there was also a main effect of product category on quality of the target product; participants reported higher quality ratings for the cookies ( $M_{\text{cookies}} = 6.75$ ) than the notebook paper ( $M_{\text{paper}} = 5.59; F(1, 91) = 10.03, p < .005$ ). The interaction between contact and product category on quality of the target product was not significant ( $F < 1$ ). In addition, there was no effect of contact, product category, or their interaction on the quality of the nontarget product (laundry detergent) to the right of the target product (all  $F$ s  $< 1$ ).<sup>1</sup>

<sup>1</sup>Subsequent studies also measured the quality of the nontarget products and found no effect, providing additional support for contagion effects being limited only to the product in contact with the source. To avoid redundancy, we do not report these measures in the subsequent studies.

### Discussion

Study 1 shows that when a source product that elicits feelings of disgust (feminine napkins) touches a target product (cookies or notebook paper), evaluations of the target are lower than when the source is simply present in the same shopping basket. Because the contagion effects do not hold when the source is in close proximity to but is not touching the target, the decrease in evaluations cannot be attributed to negative affect induced by the source's presence in the basket. Instead, it suggests that consumers believe that the source contaminates the target on contact, thus making it less desirable. The source of the contagion in this study, feminine napkins, was a highly sterilized product in a closed and sealed package and could not, in any way, contaminate the target. This illustrates that consumers can have irrational views of what is disgusting and then apply irrational contagion beliefs to objects with which they are believed to come in contact.

Evaluations of the nontarget product, laundry detergent, were not influenced by whether the source and target products were touching. This suggests that contagion effects produce a negative evaluation specific only to the target in contact with the source. Thus, in support of an underlying contamination process, contagion does not lead to general negative affect that influences evaluations of all surrounding products.

Although we predicted a difference in contagion effects for consumable versus nonconsumable target products, the results show no difference in effects. Regardless of whether the target was consumable, when the target was touching the source, ratings of both willingness to try and quality were lower than when the two products were in close proximity to each another. This emphasizes the strength of product contagion effects because they are able to lower evaluations of products that have even minimal contact with consumers' own bodies.

#### STUDY 2: DOES CONTAGION LEAD TO ENDURING CHANGE?

Having demonstrated strong and immediate product contagion effects for disgusting source products in Study 1, the focus of Study 2 is to examine whether contagion effects also produce the predicted long-lasting, enduring changes in product evaluations. Study 1 showed changes in responses reported immediately after respondents saw the target and source product in contact but did not address the longevity of these changes. Study 2 examines this issue by testing whether contagion effects still occur after a significant amount of time has passed between consumers seeing the source and target products in contact and reporting their evaluations.

#### Participants, Stimuli, and Procedure

Ninety-six undergraduate students participated in Study 2, a one-factor (contact: touching versus nontouching) between-subjects design, as part of a class demonstration. At the beginning of class, one at a time, students were asked to look carefully at the products displayed on a table at the front of the room because they would be answering questions about them at the end of class. The products were concealed behind a barrier so that students could not see them after they returned to their seats.

All students saw the same four products on the table: the source product, feminine napkins (Stayfree); the target product, chocolate chip cookies (no brand name, in a transparent package); and two nontarget products, breakfast cereal (Cheerios) and facial tissue (Kleenex). The contact manipulation was the same as in Study 1. In the touching condition, the feminine napkins (the source product) were resting slightly on the target product (cookies versus notebook paper), and in the nontouching condition, there was a six-inch space separating the source and target.

Students returned to their seats after looking at the products, and class proceeded as usual. After more than an hour had passed, students were given a survey to complete about the products they had seen earlier. Using the same scales as Study 1, students reported how much they would like to try the target product and rated the quality of the target product.

#### Results

The results indicate a main effect of contact ( $F(1, 94) = 5.36, p < .05$ ) on trying the target product. In the nontouching condition, students indicated a greater desire to try the product ( $M_{\text{nontouching}} = 7.42$ ) than when the two products were touching ( $M_{\text{touching}} = 6.26$ ). The same pattern holds true for quality of the target product. There was a main effect of contact on quality of the target product, such that participants indicated higher quality in the nontouching condition ( $M_{\text{nontouching}} = 6.37$ ) than in the touching condition ( $M_{\text{touching}} = 5.51$ ;  $F(1, 94) = 5.40, p < .05$ ).

#### Discussion

The results of Study 2 show that students still rated the target product lower when it was in contact with a disgusting source product than when it was not, even after more than an hour passed between first seeing the products and then evaluating the products. Given that students looked at the products only for a few seconds and then sat through a class listening to a lecture, taking notes, watching video clips, and participating in other interactive activities, that there was still evidence of contagion effects attests to the power of this phenomenon. This suggests that rather than creating only temporary changes in evaluations, product contagion causes meaningful changes in consumer responses to products that persist across time and amidst various distractions.

#### STUDY 3: IS THERE CONTAGION FOR NEGATIVE BUT NOT FOR DISGUSTING PRODUCTS?

Although Studies 1 and 2 both provide support for contagion effects changing product evaluations and suggest that contamination is responsible, the goal of Study 3 is to provide more concrete support for a contamination process underlying such effects by showing that contagion occurs only for disgusting source products. If a product causes other negative emotions to be experienced (e.g., anger or frustration, but not disgust), consumers have no reason to view it as a contaminating substance. Although generally negative products elicit negative affective responses in consumers, they do not possess offensive properties that are believed to be transferred on contact and therefore should not result in contagion effects.

In addition, rather than considering only the evaluations of a contaminated product, Study 3 builds on previous results by examining the influence of contagion on product

choice. By giving participants a choice between two brands of cookies—one that is clearly more desirable than the other—we test whether contagion can also lead consumers to prefer one brand over another. Specifically, we predict that when a more desirable brand has been contaminated through contact with a disgusting source product, participants will prefer a less desirable brand instead. However, because we argue that contamination is limited to disgusting products, we expect that no such reversal will occur when the source product induces anger rather than disgust.

#### *Participants, Stimuli, and Procedure*

One hundred ninety-three undergraduate students participated in Study 3 in exchange for course credit. The study was a 2 (contact: nontouching versus touching)  $\times$  2 (source product: feminine napkins versus income tax software) between-subjects design. We used the same procedure as in the previous studies; participants observed a set of four products in the front of the room and then returned to their seats to answer questions about the products. As in Study 1, in Study 3, participants reported their evaluations immediately after seeing the products.

All participants saw the same target product, chocolate chip cookies (in a transparent package), and the same two nontarget products, facial tissue (Kleenex) and breakfast cereal (Cheerios). Unlike the previous studies, the cookies had a white “Brand X” label clearly visible on the box. To determine whether product contagion effects are limited to disgust-inducing source products, the source product differed across conditions. For half of the participants, the source product was a product that consumers perceive as disgusting—feminine napkins (Stayfree). For the other half, the source product was a negative, but not disgusting, product—income tax software (TurboTax). Participants reported how much they would like to try the target product they just saw, using a scale that ranged from 1 (“not at all”) to 10 (“very much”).

Afterward, participants chose a cookie to sample and eat. They could choose their cookie either from the box of Brand X cookies they saw with the other products or from Brand Z, a different box of cookies they had not yet seen. To ensure that Brand X cookies were perceived as more desirable than Brand Z, we also provided additional information about the cookies. The two brands of cookies had the same number of calories and grams of fat, but Brand X was rated a 7.1 for average taste, whereas Brand Z was rated a 7.0, on a scale ranging from 1 to 10. Participants circled the box of cookies from which they would like to receive their sample and then were debriefed.

#### *Results*

*Pretest.* To ensure that our two source products elicited the appropriate emotional responses in participants, we first ran a pretest on 55 undergraduate students to examine the affective responses participants reported feeling about each of the two products. We created a measure of contamination by averaging how “disgusted,” “unclean,” “dirty,” and “gross” participants felt when they thought about feminine napkins (Cronbach’s  $\alpha = .86$ ) and income tax software (Cronbach’s  $\alpha = .78$ ). The results indicate that participants believed that there was significantly more contamination with the feminine napkins ( $M_{\text{napkins}} = 3.88$ ) than with the

income tax software ( $M_{\text{tax software}} = 1.96$ ;  $t(54) = 6.35$ ,  $p < .0001$ ). We also created a measure of irritation by averaging how “frustrated,” “angry,” and “annoyed” participants felt when they thought about feminine napkins (Cronbach’s  $\alpha = .87$ ) and income tax software (Cronbach’s  $\alpha = .83$ ). In contrast to beliefs about contamination, the results indicate that participants felt significantly more irritated when they thought about income tax software ( $M_{\text{tax software}} = 3.53$ ) than about feminine napkins ( $M_{\text{napkins}} = 2.27$ ;  $t(54) = 3.83$ ,  $p = .0003$ ). However, there was no difference in how bad and negative participants felt when thinking about each product (both  $ps > .59$ ). In addition, participants did not feel more disgusted when they thought about feminine napkins than irritated when they thought about tax software ( $t(54) = 1.09$ ,  $p > .28$ ). Thus, the results of the pretest suggest that feminine napkins and income tax software both produce the same level of general, negative affect in consumers, but they differ on the discrete negative emotions they elicit.

*Main study results.* The results reveal a main effect of contact on how much participants wanted to try the target product ( $F(1, 189) = 6.78$ ,  $p = .01$ ). Overall, participants wanted to try the cookies significantly more when the source and target products were not touching ( $M_{\text{nontouching}} = 7.23$ ) than when the two products were touching ( $M_{\text{touching}} = 6.23$ ). More important, these results must be interpreted in light of the significant interaction effect between contact and source on wanting to try the target product ( $F(1, 189) = 15.6$ ,  $p < .0001$ ). Participants who observed a disgusting product (feminine napkins) as the source wanted to try the target significantly more when the source and target were not touching ( $M_{\text{nontouching}} = 8.22$ ) than when they were in contact with each other ( $M_{\text{touching}} = 5.71$ ;  $F(1, 189) = 23.9$ ,  $p < .0001$ ). However, for participants who observed the negative product (income tax software) as the source, there was no difference in wanting to try the cookies in the nontouching ( $M_{\text{nontouching}} = 6.23$ ) and touching ( $M_{\text{touching}} = 6.74$ ;  $F(1, 189) = .82$ ,  $p > .36$ ) conditions.

We analyzed the proportion of participants choosing a cookie from the less desirable brand (Brand Z) using logistic regression. The results indicate a main effect of source on cookie choice ( $\chi^2(1, n = 193) = 3.75$ ,  $p = .05$ ); fewer participants chose the less desirable brand in the disgusting condition (15.1%) than in the negative condition (25.3%). However, this result should be interpreted in the context of a significant interaction between contact and source on cookie choice ( $\chi^2(1, n = 193) = 3.75$ ,  $p = .05$ ). As we predicted, participants in the disgusting condition were more likely to choose the less desirable brand of cookies in the touching condition (23.1%) than in the nontouching condition (7.41%;  $\chi^2(1, n = 193) = 4.62$ ,  $p < .05$ ), whereas participants in the negative condition were equally likely to choose the less desirable brand of cookies in the touching condition (23.1%) and the nontouching condition (27.1%;  $\chi^2(1, n = 193) = .18$ ,  $p > .66$ ).

#### *Discussion*

Study 3 shows that product contagion occurs for source products that elicit disgust but not for products that elicit only other negative affective responses. This offers strong support for an underlying contamination process and is consistent with our conjecture that compared with other negative emotional experiences, disgust is uniquely related to

beliefs about contamination. Although other negative emotions also elicit strong responses, they do not share this overlap with contamination beliefs and do not lead to contagion between products perceived as touching.

Study 3 also demonstrates that contagion effects are not limited to perceptions of individual products but can influence product choice as well. Indeed, the results show that some consumers may even change their brand preferences as a result of contamination. Rather than causing momentary changes in evaluations, this suggests that product contagion can have long-lasting effects that influence subsequent purchases of contaminated products.

Together, Studies 1–3 also demonstrate that actual physical contact with a disgusting object is not critical to obtain product contagion. Rather, perception of contact is sufficient to result in a product contagion effect. In all three studies, the disgusting product was contained in a package and could not come in contact with the target product, which was also in a sealed package. However, participants believed that the physical contact between product packages represented contact between the products themselves and, as a result, contaminated the target product. This distinction between perceived and actual contact is important both theoretically and from a managerial perspective. Theoretically, previous research has documented contagion effects only when direct physical contact occurs between the source and the target objects or persons. If this is applied in a product context, there would be few opportunities for contagion to occur in “real-world” settings. However, perceived contact driven by product package contact is a situation that occurs frequently for consumers. Combining the frequency of perceived contact with the results of the survey we discussed previously, which demonstrated that many products elicit disgust, suggests that product contagion can occur far more frequently than previously believed.

#### STUDY 4: IS VISUALIZATION NECESSARY FOR CONTAGION?

The first three studies all provide evidence for product contagion occurring for consumer packaged goods that elicit disgust. Even when these products are protected by their packaging and cannot influence other products through actual contact, consumer evaluations are lower for products that touch packages of products they find disgusting. In Study 4, we investigate the role of perceived contact on these effects more closely by examining different package types. Specifically, we explore whether product contagion still occurs when the target product is displayed in an opaque package rather than a clear one. Because the opaque package does not allow consumers to visualize the source product that is touching the target product, it inhibits the perception that the two products are touching and exchanging properties. As a result, we predict that there will be an interaction between contact and package type; specifically, target products displayed in clear packages will have lower evaluations as a result of product contagion, but target products displayed in opaque packages will not be affected by contact with the source product.

In addition to examining the influence of perceived contact, Study 4 extends contagion effects to another product category (lard) that focuses on a different property of disgust. Rather than being perceived as disgusting in general,

this category is deemed to be disgusting because it is extremely fattening. This adds to the generalizability of our results by suggesting that any product that induces disgust is subject to contagion effects, regardless of whether the disgust is general or attribute specific.

#### Participants, Stimuli, and Procedure

Participants in Study 4 were 48 undergraduate students who completed the study in exchange for course credit. The study was a  $2 \times 2 \times 2$  mixed design that crossed contact (nontouching versus touching [between-subjects]) with package type (clear versus opaque [between-subjects]) with product category (feminine napkins/cookies versus lard/rice cakes [within-subjects]).

We used the same procedure as in the previous studies; that is, participants observed a set of four items on a table and then answered questions about them. The first set of products consisted of feminine napkins, chocolate chip cookies, laundry detergent, and breakfast cereal. In addition, the arrangement of items for both the nontouching and the touching conditions matched that of the previous studies.

Although the packaging of feminine napkins, laundry detergent, and breakfast cereal remained the same for both package-type conditions, the packaging of the cookies differed. For the clear condition, the cookies were in a clear plastic container with no label. For the opaque condition, the cookies were in the same plastic container, but it was covered completely with royal blue paper and a label that read, “Chocolate Chip Cookies.” After looking over the products, participants rated how much they wanted to try one of the cookies on the same scale as we used previously.

Participants then repeated this entire procedure for the second set of items; the source was lard (Farmer John’s), the target was rice cakes (no brand), and the two nontarget products were facial tissue (Kleenex) and dishwashing detergent (Sunlight). After looking at the second set of items, participants reported how much they wanted to try one of the rice cakes.

#### Results

We ran the analysis using a 2 (contact [between-subjects])  $\times$  2 (package type [between-subjects])  $\times$  2 (category [within-subjects]) repeated measures analysis of variance. The results reveal a main effect of product category on wanting to try the target product ( $F(1, 44) = 41.0, p < .0001$ ). Overall, participants wanted to try the cookies significantly more than the rice cakes; however, there were no significant interactions between product category and either of the other two factors.

The results indicate a significant interaction between contact and package type on wanting to try the target product ( $F(1, 44) = 7.41, p < .01$ ). When the target was displayed in a clear package, participants indicated a significantly higher desire to try it in the nontouching condition ( $M_{\text{nontouching}} = 6.37; F(1, 44) = 6.99, p < .05$ ) than in the touching condition ( $M_{\text{touching}} = 4.19$ ). However, when the target was displayed in an opaque package, there was no difference in how much participants wanted to try it in the nontouching condition ( $M_{\text{nontouching}} = 4.61$ ) versus the touching condition ( $M_{\text{touching}} = 5.57; F(1, 44) = 1.41, p > .24$ ).

### Discussion

Study 4 provides strong support for perceived contact moderating contagion effects. When the target product is displayed in a clear package that enhances perceived contact with the source product, evaluations are lower than when there is space separating the two products. However, if the target is displayed in an opaque package, thus decreasing perceived contact, contagion does not occur and evaluations remain the same. These findings counter previous work in packaging that suggests that incorporating visual imagery into a product package is beneficial because it elicits imagery processing (MacInnis and Price 1987). Indeed, in this case, it is precisely because consumers viewing products in clear packages spontaneously imagine how the products look, taste, and feel that product evaluations decrease when they are in contact with a disgusting source product. MacInnis and Price (1987) restrict their focus to positive visual imagery, whereas we find that product contagion leads to negative visual imagery.

Study 4 also shows that the source product does not need to be viewed as generally disgusting to elicit contagion effects but that specific attributes that cause a product to be perceived as disgusting may also lead to these same effects. In this case, we tested a product that is perceived as disgusting because it is extremely fattening. Rather than producing a general “ick” feeling, lard is perceived as disgusting because it has a particular attribute that people find offensive. Given these findings, in the next study, we test whether product contagion can result in the transference of a specific attribute so that people believe that the target product has higher levels of that specific attribute after it has been in contact with the source product.

#### STUDY 5: CAN PRODUCT CONTAGION OCCUR AT THE ATTRIBUTE LEVEL?

In addition to replicating the moderating role of perceived contact, Study 5 examines whether product contagion effects are limited to general product evaluations or whether they also occur at the attribute level. If consumers evaluate products as if physical contact results in a transfer of specific offensive properties from one product to another, products with attributes deemed to be disgusting should transfer those attributes to the products they touch. On the basis of this reasoning, Study 5 tests whether participants will perceive a fattening product as transferring its fat content to a target product on contact, making the target seem not only less desirable in general but also higher in fat. This finding would not only establish product contagion at the attribute level but also provide further support that product contagion occurs through contamination and not simply through negative associations.

#### Participants, Stimuli, and Procedure

Participants in Study 5 were 99 undergraduate students who completed the study in sessions outside of class in exchange for course credit. The study was a 2 (contact: non-touching versus touching)  $\times$  2 (package: clear versus opaque) between-subjects design.

The procedure was similar to the previous studies. The source product was lard, the target was rice cakes, and the nontarget products were facial tissue and liquid dishwash-

ing detergent. In the touching condition, the source and target product packages were in contact, and in the nontouching condition, they were separated. For the clear condition, the rice cakes were in clear plastic wrap with no label, and in the opaque condition, the rice cakes were covered with royal blue paper with a label that read, “Rice Cakes.”

After participants saw the products, they reported how much they would like to try one of the rice cakes. In addition, participants rated the fat content of the rice cakes on a scale ranging from 1 (“very low in fat”) to 10 (“very high in fat”), as well as the number of calories in the rice cakes on a scale ranging from 1 (“very few calories”) to 10 (“very high in calories”).

#### Results

The results reveal a significant main effect of contact on wanting to try the target product ( $F(1, 95) = 6.33, p < .05$ ). Participants wanted to try the target significantly more when it was not touching the source ( $M_{\text{nontouching}} = 2.88$ ) than when it was in direct contact with it ( $M_{\text{touching}} = 2.08$ ). However, this main effect should be interpreted in light of the two-way interaction between contact and package type. As we predicted, there was a significant interaction between contact and package type on wanting to try the target ( $F(1, 95) = 4.38, p < .05$ ). In the clear-package condition, participants wanted to try the target significantly more when it was not touching the source ( $M_{\text{nontouching}} = 3.46$ ) than when it was in direct contact with it ( $M_{\text{touching}} = 2.00$ ;  $F(1, 95) = 3.13, p < .01$ ). In the opaque-package condition, however, there was no difference in how much participants wanted to try the target across the two contact conditions ( $M_{\text{nontouching}} = 2.30, M_{\text{touching}} = 2.17$ ;  $F(1, 95) = .31, p = .76$ ).

The results also show a significant interaction between contact and package type on the perceived fat content of the target product, rice cakes ( $F(1, 95) = 3.80, p = .05$ ). In the clear-package condition, participants rated the fat content as significantly lower when it was not touching the source product, lard ( $M_{\text{nontouching}} = 2.21$ ), than when it was in direct contact with it ( $M_{\text{touching}} = 3.67$ ;  $F(1, 95) = 2.36, p < .05$ ). In the opaque-package condition, however, there was no difference in the perceived fat content of the rice cakes across the two contact conditions ( $M_{\text{nontouching}} = 3.63, M_{\text{touching}} = 3.46$ ;  $F(1, 95) = .31, p = .76$ ).

The main effects of contact and package type, as well as the interaction between the two factors, were all not significant for the number of calories participants believed to be in the rice cakes (all  $ps > .25$ ). Participants in all conditions viewed the rice cakes as having the same number of calories, showing that contact with lard influences only the perceived fat content of the rice cakes and does not lower the attractiveness of all attributes.

#### Discussion

Study 5 replicates the findings of Study 4, showing that contagion occurs only when target products are in clear, as opposed to opaque, packages. Together, these studies suggest that when consumers are more able to visualize the source touching the target product and believe that there is contact between them, contagion effects are more likely to occur. When perceived contact is low, consumers do not believe that the products have exchanged properties, and

evaluations of the target remain the same. However, when consumers are able to visualize the two products in contact, they imagine that the source transfers its properties to the target, thus making the target less desirable. Thus, visualization appears to be critical for contagion. When products are out of sight, the possibility of contagion is also out of mind.

That Study 5 found contagion effects at the attribute level provides additional support for an underlying contamination process. Not only does contact with a fattening product make a target less desirable overall, but it makes the product seem higher in fat content as well. However, the higher-fat perceptions cannot be attributed to a negative halo effect resulting from contact with a disgusting source, because perceptions of the number of calories in the rice cakes remained unchanged across all conditions. Instead, the results suggest that when people believe that there has been contact between a disgusting product and another product, they believe that the disgusting product transfers the specific offensive attributes, thus making the other product disgusting.

Consistent with previous research on contagion (Rozin and Kalat 1971), the results of Study 5 indicate that negative product contagion, in which contact with a source product devalues the target, is more powerful than positive contagion, in which contact with a source enhances the value of the target. This asymmetry suggests that there is no antidote to reverse the effects of contact with a disgusting product. Although disgusting products can lower evaluations of products with positive perceptions on contact, products with positive perceptions cannot increase evaluations of disgusting products. If it is assumed that low fat is a positive attribute, this indicates that a fattening product can make a low-fat product seem less desirable and higher in fat, but a low-fat product cannot make a fattening product seem more desirable and lower in fat.

#### STUDY 6: PRODUCT CONTAGION—ASSOCIATION OR CONTAMINATION?

In the previous studies, we assumed that people felt more disgusted when the source and target products were perceived as being in contact with each other, but we never directly measured affective responses. As a result, Study 6 measures specific feelings to demonstrate that perceived contact with a disgusting source leads people to feel disgust, and these feelings of disgust lead people to form lower evaluations of the target. Thus, we predict that feelings of disgust will mediate evaluations of target products.

In addition, to investigate the likelihood of contagion effects occurring in a retail context, in which consumers are often cognitively busy, Study 6 examines whether contagion effects are an automatic or a more conscious process. Specifically, we included a cognitive capacity manipulation to determine whether contagion effects still hold even under constrained cognitive ability. We did not expect that there would be a difference across the cognitive capacity conditions for two reasons. First, disgust has been shown to be a basic emotion with a characteristic facial expression and distinctive physiological manifestation. Second, previous research in emotion has indicated that unlike other emotions, such as sadness and guilt, disgust is likely to be elicited automatically by the activation of hardwired

sensory-motor programs involved in bioregulation (Pham et al. 2001).

#### Participants, Stimuli, and Procedure

Sixty-six undergraduate students participated in Study 6, a 2 (contact: nontouching versus touching)  $\times$  2 (cognitive capacity: normal versus constrained) between-subjects design. The procedure was similar to the previous studies. The source product was feminine napkins, the target was cookies (in a transparent package), and the nontarget products were laundry detergent and breakfast cereal. We used a digit-rehearsal task to manipulate cognitive capacity. In the normal condition, participants rehearsed a three-digit number while looking at the products, and in the constrained condition, participants rehearsed a ten-digit number.

After participants saw the products, they reported how much they would like to try one of the cookies and indicated the degree to which they experienced various affective responses while looking over the products on a scale ranging from 1 ("not at all") to 10 ("to a great degree"). We compiled the list of feelings from several affect-related articles (e.g., Ellsworth and Smith 1988a, b; Storm and Storm 1987) and included four items intended to measure disgust. Finally, in a free-recall task, participants listed all the products they could remember seeing.

#### Results

The results reveal a significant main effect of contact on wanting to try the target product ( $F(1, 62) = 4.67, p < .05$ ). Participants wanted to try the target significantly more when it was not touching the source ( $M_{\text{nontouching}} = 7.21$ ) than when it was in direct contact with it ( $M_{\text{touching}} = 5.73$ ). The main effect of cognitive capacity and the interaction between contact and cognitive capacity on wanting to try the target were both not significant ( $F_s < 1$ ). In the normal ( $M_{\text{nontouching}} = 7.08, M_{\text{touching}} = 5.47$ ) and the constrained cognitive capacity ( $M_{\text{nontouching}} = 7.35, M_{\text{touching}} = 6.0$ ) conditions, participants wanted to try the cookies more when the source and target packages were not touching.

We created a measure of disgust by averaging how "disgusted," "revolted," "gross," and "unclean" participants felt when looking over the products (Cronbach's  $\alpha = .81$ ). The results indicate a significant main effect of contact on disgust ( $F(1, 62) = 8.46, p < .01$ ). Participants felt significantly less disgust when the source and target were not touching ( $M_{\text{nontouching}} = 1.84$ ) than when they were ( $M_{\text{touching}} = 2.86$ ). The main effect of cognitive capacity and the interaction between contact and cognitive capacity on disgust were both not significant (all  $p_s > .25$ ).

A mediation analysis (Baron and Kenny 1986) showed that disgust mediates willingness to try the cookies. Contact (the independent variable) is a significant predictor of willingness to try the cookies (the dependent variable;  $\beta = 2.23, p < .05$ ) and disgust (the mediator;  $\beta = 2.85, p < .01$ ). Disgust is a significant predictor of willingness to try the cookies ( $\beta = 3.15, p < .01$ ). However, when we include both disgust and contact in the model for willingness to try the cookies, only disgust remains significant ( $\beta = 2.54, p < .05$ ). Contact is reduced to nonsignificance ( $\beta = 1.33, p > .18$ ), thus providing support for the mediating role of feelings of disgust.

An analysis of the free-recall data permits further insight into the process underlying the product contagion effects. We argue that the effects are due to contagion and the belief that the target becomes contaminated through contact with the source product. However, another explanation is that the effects could alternatively be the result of a stronger association in memory linking the target more directly with the source when they are touching, though the results of previous studies are inconsistent with such an explanation. The order in which participants listed the products they saw helps address this issue. The results of the recall data indicate no difference across contact conditions of whether the target and source products were listed next to each other or not ( $\chi^2(1, n = 66) = .40, p > .52$ ). In the touching condition, 26 participants listed the two products next to each other, and 7 participants listed them apart, and in the nontouching condition, 28 participants listed the two products next to each other, and 5 participants listed them apart. If contagion effects are indeed the result of a stronger association between the source and the target of what we refer to as contagion, we would expect that the two target products would be recalled more often next to each other in the touching than the nontouching condition. The data do not support an association explanation but are consistent with our proposed contagion mechanism.

### *Discussion*

When people observe a disgusting source in contact with another product, even when they are both in protective packages, the results of Study 6 show that they experience higher levels of disgust. These feelings of disgust then mediate responses to the target and lower evaluations of it. This process appears to be somewhat automatic, occurring even when cognitive capacity is constrained. Consistent with previous research, people seem to have a negative, gut reaction to products that are in contact with disgusting objects, and even when people do not think about it, the negative reaction results in lower evaluations of the target (Pham et al. 2001). Thus, even under constrained capacity, consumers are likely to exhibit product contagion effects.

It is interesting to consider when the contamination observed in Study 6 may have occurred. Did it occur at the time of exposure to the contamination or at the time formal evaluation was reported? Recent research on automatic attitude formation suggests that consumers are highly likely to generate attitudes spontaneously at the time of exposure to the contamination. Substantial evidence has shown that evaluative information about objects is activated within a fraction of a second of exposure and requires neither motivation to evaluate nor conscious perception of the attitude object (e.g., Fazio 2001; Fazio et al. 1986; Ferguson and Bargh 2004; Greenwald, McGhee, and Schwarz 1998). Fazio (1989), among others, argues that it is functional for attitudes to be automatically formed because this permits people to determine quickly whether their environment contains sources of potential harm or reward and then either to approach or to avoid accordingly. In the context of disgusting products, we believe that it would be highly functional for consumers to determine automatically which products were potentially contaminated and then to avoid them, often without even consciously attending to them. The results of Study 6 are consistent with this conjecture.

In addition to showing that product contagion effects are driven by disgust, Study 6 provides support for a contamination process underlying such responses. As the results indicate, there was no difference in how often participants listed the target and source next to each other across the two contact conditions. In both the touching and the nontouching conditions, most participants recalled the two products next to each other. This suggests that the lower evaluations of the target in the touching condition are not the result of a stronger association between the source and the target product. Rather, it indicates that the target itself has been tainted or contaminated through contact with the source.

### *GENERAL DISCUSSION*

Across six studies, we find strong evidence for the existence of product contagion among consumers. We find that when products elicit disgust and are in contact with other products, evaluations of the other products are lowered through a contamination process. We find that these effects hold even when actual contact does not take place and that only perceived contact is necessary for contagion to occur. In addition, we find that these effects are not temporary but persist across time and can influence choice, reflecting a meaningful change in evaluations.

Our results are consistent with prior research on general contagion effects that found that people were largely unwilling or unable to admit that the reason for their impression or opinion about another person or object was based on a belief that contagion had occurred (Rozin, Millman, and Nemeroff 1986). We also find no evidence that the product contagion effects we observed occur through conscious means.

Notably, we find that product contagion has a strong, visual component; specifically, the more easily imagined the physical contact between the source and the target of contagion, the greater is the transfer of negative properties and the decrease in evaluations. Visualization has not been discussed previously with regard to contagion, but our results suggest that it has important implications for marketers. By packaging products in transparent containers, marketers increase the likelihood of their products being subject to contagion effects. Conversely, by preventing visualization with opaque containers, marketers can successfully block the contamination process from occurring.

Although prior work has demonstrated cases of positive contagion, in which the value of an object is increased through contact (Rozin, Millman, and Nemeroff 1986), our results show only cases of negative contagion, in which the value of the target object is always lowered. However, this focus on negative contagion was intentional because positive contagion is unlikely to be the result of a residue model resulting from physical contact alone. Unlike negative contagion, positive contagion has been found to be strictly the result of a symbolic interaction model based on interpersonal/moral factors, such as a contamination source having a positive relationship with the recipient (e.g., friend, lover) (Nemeroff and Rozin 1994). Consequently, positive contagion is not likely to occur between products in a retail context, because they are not typically viewed as having interpersonal or moral characteristics. So although consumers have positive associations with certain products, the contagion process of products transferring properties through a

residue on contact is likely to be limited to negative outcomes alone. This is not to say that positive contagion cannot take place for products (e.g., people pay thousands of dollars on eBay for items associated with celebrities) but rather that such examples are primarily the result of associations and are not driven by physical contact between the source and the target.

It may be useful to consider the notion of product contagion as a heuristic. As are many other decision-making rules of thumb, it is often successful in leading people to make approximately correct conclusions and decisions. In general, contact causes influence. For example, if a person ingests a lot of fat, he or she becomes fat. Eating large amounts of carotene in tomatoes or carrots leads to an orange skin pigmentation. Eating lots of garlic leads to garlic aroma in breath and sweat (Nemeroff and Rozin 1989). As a result, making decisions that are consistent with the general principle of contact causing influence is a useful rule of thumb. However, as can many other heuristics, the notion of product contagion can be misapplied. Given the large number of opportunities for the misapplication of product contagion, the nonconscious aspects of its application, the lasting effects of contagion on consumer evaluations, and consumer resistance in general to debiasing attempts, product contagion is a phenomenon that warrants further research and additional attention from marketers in particular.

The survey we reported in the beginning of this article demonstrates that disgusting products are commonly found in supermarkets and shopping carts. Although these products may not be intentionally placed near other products, because they are purchased so frequently, they regularly come in contact with other products. For example, in our current research, we observe strong product contagion effects with lard as a source of contagion. Lard is often placed in a section of the store for baking products, pans, and utensils and therefore may have opportunities to contaminate these products. Other examples of product collocation decisions that could lead to product contagion include baby food and diapers as well as mayonnaise and soup. Perhaps more critically, each item that is selected from a shelf ultimately ends up in the consumer's shopping basket, with little control over which products touch one another. Grocery stores seem to be aware that consumers worry about raw meat (which is already wrapped) contaminating other products in the cart and have begun placing plastic bags near the meat section to allow consumers to double-wrap their meat.

Although marketers cannot control where consumers place products in a cart, they have several approaches for reducing the negative influence of disgusting products on other products. For example, one solution to the commingling of products in a cart or basket is to provide more partitions or separate sections in the shopping cart. Although many carts currently have one partitioned area, it has the unfortunate characteristic of being the section closest to the consumer and most visible to others. Additional partitioning approaches could help reduce the potential of product contagion in the shopping cart.

Our findings regarding the visual aspects of product contagion also highlight actions marketers might consider taking. When product packages of target products were clear,

they were more vulnerable to being considered contaminated by disgusting source products. Thus, shifting to product packages that are opaque or that otherwise reduce the visualization of contamination taking place could also reduce potential for product contagion. Although previous research indicated that clear packages and visualization have benefits for some products, opaque packing might be better for others with greater potential for contamination. For example, marketers of products that are often purchased at the same time as a disgusting product (e.g., candy or gum is often bought at the same time as cigarettes) should expect high contamination potential and should consider using opaque packaging.

In summary, although there may be a temptation to dismiss product contagion as an issue of limited concern to marketers, the combination of (1) a relatively large proportion of the typical shopping basket being perceived as at least moderately disgusting, (2) the frequency of potential product contagion situations both on the shelf and in the shopping cart, and (3) the opportunity to take corrective managerial action all suggest that product contagion is a pervasive, everyday occurrence for many consumers. Thus, marketing managers need to address and manage this issue explicitly.

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