Disgust Cubed: the Effect of Pathogen, Moral, and Sexual Disgust on Product Evaluations, Avoidant Behaviour, and Attributions

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A Thesis

in

John Molson School of Business

Presented in Partial Fulfillment of the Requirements

For the Degree of Master of Science (Administration) at

Concordia University

Montreal, Quebec, Canada

September 2011

CONCORDIA UNIVERSITY
School of Graduate Studies

This is to certify that the thesis prepared

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Entitled: Disgust Cubed: the Effect of Pathogen, Moral, and Sexual Disgust on Product Evaluations, Avoidant Behaviour, and Attributions

and submitted in partial fulfillment of the requirements for the degree of

Master of Science (Administration)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

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ABSTRACT

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Zack Mendenhall

Recent research on emotions has begun to distinguish independent domains within a single emotion. In line with this approach, the present thesis attempts to demonstrate that the emotion of disgust can be broken into three independent subdomains, and that each domain has a separate implications for the study of consumer behaviour.

Research in marketing has started to unveil the role of disgust in consumer decision making. Chiefly, it has demonstrated that consumer evaluations are more negative for contaminated (versus uncontaminated) products, and that the mechanism behind this effect appears to be the activation of disgust. Throughout the marketing literature, disgust is treated as a domain-general, unitary construct. In other words, no distinctions are drawn between different types of disgust. However, evolutionary models of disgust have revealed that individuals differ in their sensitivity to disgust across three independent domains (pathogen, sexual, and moral).

Across two studies, we examine the effects of pathogen, moral and sexual disgust on product evaluations (study 1) and person attributions (study 2). We hypothesize that each domain of disgust should elicit domain-specific avoidance strategies, and this effect will be moderated by individual differences in domain-specific sensitivity to disgust.

ACKNOWLEDGEMENTS

First and foremost I would like to thank my mother and sister for their support and wisdom. I would also like to thank Dr. Saad for his enthusiasm, gusto, and stimulating lab meetings. I'd like to thank Betty and Lynn for their charm, humour and always having all the answers. Additionally, I thank the members of my committee, Dr. Walsh and Dr. Arsel, not only for their service on my committee, but also for exposing me to their work, and for the engaging chats we had during JMSB gatherings. Last, but far from least, I would like to acknowledge the instrumental role that Eric Stenstrom has played in my time at Concordia. Since I first met Eric during my campus visit in 2008 he has been a pillar of academic support and brotherly friendship. Countless times, I have benefitted from Eric's generosity. Words will never adequately convey how thankful I am to have him around.

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INTRODUCTION

Imagine that you are lifting the last hefty bite of a delicious filet mignon to your lips. After you place it in your mouth, you pause to savour it. When you look down, you notice that the piece in your mouth had been covering something strange on your plate. You lean down to get a closer look. This vantage point reveals that it is a large, dead cockroach on your plate. You will probably eject the morsel from your mouth, your face will likely cringe, and you may go so far as to involuntarily vomit. The once- delicious steak has become utterly revolting. These responses (oral rejection, cringed facial expression, involuntary vomiting, and devaluing of the meal) are all features of the emotion we call disgust (Rozin and Fallon, 1987; Rozin, Lowery, and Ebert, 1994). Importantly, these responses also serve an adaptive purpose: the avoidance of pathogenic material. But does disgust serve other functions as well? The fact that many non-infectious scenarios strongly activate disgust suggests that it may.

The focus of this thesis will be how an adaptive conceptualization of disgust can illuminate the domains under which disgust is operative in consumers' lives. I aim to add explanatory depth to the existing literature on disgust by testing an adaptive functionalist model of disgust in consumer settings. This model incorporates three domains of disgust: 1) the pathogenic domain discussed in the opening example, 2) a sexual domain, and 3) a moral domain (cf. Tybur, Lieberman and Griskevicius, 2009; and Schaich Borg, Lieberman and Kiehl, 2008). Previous research on consumer disgust has utilized a domain-general theory of disgust. A goal of the present thesis is to demonstrate how a three-domain model can increase our understanding of the role of disgust in consumer decision making. In order to justify the use of this less established model, I will provide an overview of traditional and evolutionary models of the emotions in general, and disgust in particular. Then I will criticize the chief model of disgust in the psychology literature, and argue for the merit of the adaptive functionalist model.

Emotions in Psychology and Marketing

Non-Evolutionary Approach to Emotions

The emotions have a wide catalogue of influences on our evaluative processes and subsequent behaviour (cf. Cohen, Pham, and Andrade, 2007, and Pham, 2004 for reviews). A major thrust in the emotions literature has been to examine the difference between positively and negatively valenced emotions during evaluative tasks. For example, the Affect Infusion Model (AIM; Forgas 1995) states that the valence of one's current affect will be 'infused' into one's evaluations of new targets. The more positive/negative one is feeling, the more positive/negative one's evaluations are. These effects are found across a wide array of stimuli, including consumer behaviour variables such as products (Gorn, Goldberg, and Basu, 1993) and ads (Murray and Dacin, 1996). While affect valence is an important perspective in understanding emotions, some have over-emphasized its value, stating "the only relevant aspect of emotion is their valence" (Elster 1998, p. 64; as cited in Griskevicius, Shiota, and Nowlis, 2010, p. 239).

Other researchers have acknowledged that equally valenced emotions can influence evaluations and behaviours differently. For instance, fear tends to induce risk aversion while anger tends to induce risk tolerance, despite the fact that they are both negative (Lerner and Keltner, 2001). Such findings are typically explained within what is called appraisal-tendency theory. Appraisal tendency theory posits that each emotion can be defined by the contextual factors which elicit it. Examples of such factors include (but are not limited to) safety, control, and novelty. For example, a prerequisite appraisal one must make in order to experience fear is that one is in danger (a lack of safety). Standing ten feet from a lion at the zoo is fun because you are safe. Standing ten feet from the same lion on an open plain is terrifying because you are not safe. Anger, on the other hand can occur when safety is high or low. One can get angry at a

spouse for forgetting to take the garbage out (a harmless mistake), or angry at the drunk driver who nearly killed you on the road (a very dangerous mistake). Thus, appraisals of safety are a prerequisite for activating fear, but not for activating anger.

So appraisal theory adds theoretical depth to the affect-valence model of the emotions (which simply proposes that the positivity or negativity of an emotion was what produced behaviour). However, both affect-valence and appraisal-tendency research on emotions emphasize only a single dimension of the emotional experience at a time (e.g. 'negative affect' or 'appraisal of safety'). While this strategy is valuable for building a model of the emotions from the bottom up (by examining one mechanism at a time), an evolutionary approach towards the emotions adds to the literature by building a picture of the emotions from the top down (by examining one adaptive function at time). Evolutionary theories of the emotions propose that the emotions are mental adaptations. By focusing on the function of the emotions, evolutionists can make highly informed predictions about emotional influences on behaviour without needing to isolate emotional mechanisms one at a time. We elaborate on this point below.

Evolutionary Approach to Emotions

An evolutionary approach to the emotions treats them as complex states of mind that predispose us to behave in evolutionarily optimal ways across a variety of situations (Cosmides and Tooby, 2000; Griskevicius, et al. 2009; Nesse, 2005). Armed with the laws of natural and sexual selection, one can appreciate how emotions act to facilitate our survival and reproduction. For example, fear is clearly designed to keep us alive in the face of mortal danger, and lust is clearly designed to facilitate sexual behaviour in the face of suitable partners.

However, before we delve into how evolutionary psychologists study the emotions, we need to discuss how they study the mind.

The fundamental premise of evolutionary psychology is that the brain (like the rest of the body) is the product of natural and sexual selection. These selective processes naturally create species that are well-designed for the exploitation of their immediate environment. In other words, evolution always drives organisms to better 'fit' their environment, in ever more efficient ways. This basic premise has dire implications for the traditional vision of the mind as a general learning machine (Pinker, 2003). After all, how could evolution select for a brain that does everything? The do-everything brain would be prohibitively expensive to grow and maintain, and dubiously beneficial. While the do-everything brain would waste time and energy on tasks evolutionarily irrelevant tasks, more specialized brain designs would invest time and energy on the evolutionary cornerstones of surviving and reproducing . They would spend more time murdering their rivals, seducing sexual partners, and jealously guarding their mates. In other words, the do-everything brain would lose the genetic arms-race against its leaner, more specialized contemporaries. Thus, an evolutionary perspective sees the mind as a collection of mental adaptations that are well-designed at solving problems that were recurrent barriers to reproduction and survival.

Saad (2007) has posited that mental adaptations can be categorized into one of four broad modules: Reproduction, Survival, Kinship, and Reciprocity. While all adaptations must ultimately lead to reproduction of genetic material, surviving, helping one's family, and establishing a network of trustworthy friends are all ways of assisting the organism towards its central function: passing on its genes. An example of a survival adaptation is predator-

avoidance. When we feel scared of the dark, it is our predator-avoidance mechanism calling out to us, telling us to seek refuge and companions to keep us safe from nocturnal carnivores.

Given that evolutionary theory implies a radically different way of thinking about the mind, its implications are far-reaching. Evolutionary theory has been successfully applied in all of the usual subdomains of psychology (cf. Buss 2005 for reviews of the application of evolutionary theory to clinical, cognitive, developmental, personality and social psychology). Evolutionary theory also yields major implications for the study of consumer behaviour (Durante et al., 2011; Griskevicius et al., 2009; Griskevicius, Shiota, and Nowlis, 2010; Saad, 2003, 2004, 2006, 2007, 2008, 2011; Saad and Gill, 2000, 2003; Saad, Gill, and Nataraajan, 2005; Saad and Peng, 2006; Saad and Strenstrom, 2011; Saad and Vongas, 2009; Sundie et al., 2010). Generally speaking, evolutionary theory hasn't seen much use within the marketing discipline, but is slowly gaining greater acceptance.

In regards to the emotions, evolutionary approaches have converged on a definition of the emotions as states of mind which orchestrate the functioning of different mental adaptations towards a common, evolutionarily relevant outcome (Cosmides and Tooby, 2000, Nesse, 2005). This perspective rejects the notion of a primary aspect of emotion (such as valence), and distinguishes between the emotions by identifying the adaptive problems they each solve, rather than their valence or the appraisals that elicit them. Only two papers in consumer behaviour have utilized an evolutionary perspective on the emotions. Griskevicius et al. (2010) investigated the different effects of pride and contentment on product choice, while Griskevicius et al (2009) investigated the different effects of fear and romance on persuasion effectiveness. However, no consumer behaviour studies have investigated subtle differences within a single emotion. I propose that disgust, with its wide range of eliciting circumstances, may constitute such a case.

Disgust

Non-Evolutionary Origins

Disgust is a negative emotional state that is generally linked with a strong desire to avoid the eliciting stimulus. Early conceptualizations of disgust focused on the rejection of potentially infectious or harmful material (Angyal, 1941; Darwin, 1872/1965; Rozin & Fallon, 1987). However, these theoretical models failed to explain why we feel disgusted by specific elicitors such as incest or deceit. In order to explain these non-ingestion-related triggers of disgust, researchers began to consider additional domains of disgust. In this area, the work of Paul Rozin and his colleagues is perhaps the most well-known (Haidt, McCauley, & Rozin, 1994; Haidt, Rozin, McCauley, & Imada, 1997; Rozin & Fallon, 1987; Rozin, Haidt, & McCauley, 2000; Rozin, Lowery, & Ebert, 1994; Rozin, Millman, & Nemeroff, 1986, Rozin, Taylor, Ross, Bennett, and Hejmadi, 2005).

The model enunciated by Rozin et al. (2000) includes four domains: a) core disgust; b) animal reminder disgust; c) interpersonal disgust and; d) moral disgust. Core disgust functions to protect the body from contamination, and is the only domain which is derived via adaptationist logic. Core disgust is triggered in the presence of potentially infectious material. Animal reminder disgust is posited to protect the individual's 'soul' by preventing us from realizing that we are animals. What is meant by 'soul' is dubious, and is a limitation that I will discuss in the next paragraph. Nevertheless, activities and drives that are associated with animals are thought to trigger animal reminder disgust. Being reminded of our animal nature makes us feel "lowered, debased, and (perhaps most critically) mortal" (Rozin et al. 2000, p. 642, cited in Tybur et al., 2009, p. 104). Interpersonal disgust also protects the soul, but additionally helps to

maintain social order and motivates the avoidance and/or punishment of norm-violating individuals. The function of moral disgust is also to maintain social order, and is activated by violations of moral rules. The four-domain model of disgust put forward by Rozin and his colleagues certainly captures the range of disgust qualia, but it suffers from several theoretical and empirical shortcomings.

Despite its frequent use in both the psychology and the marketing literature, substantive theoretical concerns exist with the Rozin model (as enunciated in Tybur et al., 2009). Two issues stand out conspicuously. First, it is unclear what "protect the soul" actually means. Without knowing what the soul is, whether or not it actually exists, what it does, and why it is vulnerable, it is difficult to accept that it needs protection. Second, many of the purported domains of disgust share functions. For example, animal reminder disgust and interpersonal disgust both serve to protect the soul, and moral disgust and interpersonal disgust both serve to maintain social order. From an adaptationist perspective, it is evolutionarily uneconomical (and thus, unlikely) that there would be three different domains to serve two functions. Recall that evolution is efficient, and tends to shave away unnecessary features of an organism in favour of streamlined, specialized adaptations. Finally, the most quantifiable shortcoming is that tests of the independence of these subdomains (using "The Disgust Scale" – developed by Haidt, McCauley, and Rozin, 1994) routinely exhibit very poor reliability, which undermines the theoretical distinctiveness of each domain (for a more complete statistical analysis of the limitations of this scale, see Tybur et al., 2009). Despite Haidt et al. (1994)'s own conclusion that the scale can only be interpreted as a unidimensional general disgust sensitivity measure, many studies in psychology have interpreted the scale as a multidimensional measure (Calder et al., 2000; Goldenberg et al., 2001; Rozin et al., 2005).

Within marketing, only a few investigators have looked at disgust's influence on consumer behavior, but they usually adopt a simplified version of Rozin's work (Argo, Dahl & Morales, 2006; Morales & Fitzsimons, 2007; Mishra, 2009). Marketing researchers universally treat disgust as a domain-general phenomenon, and (wisely) ignore the subdomains posited by Rozin. However, even an abbreviated, less presumptuous model of disgust is not without its flaws. Argo et al. (2006) found that consumers avoid products that they suspect have been touched by other consumers. This avoidance was greater when a) the product was evaluated close to versus far away from the site of contamination, b) was contaminated recently versus long ago and c) was contaminated by many versus few people. The authors suggest that the essence of the contaminator was transferred to the t-shirt via implied touch. Accordingly, they posit that the act of contamination 'stigmatized' the T-shirt, which led to reduced evaluations. Nowhere in their discussion do they mention that their participants may have simply behaved adaptively in the face of potential infection. Shirts touched by others are simply more likely to have more germs on them. Such a simple explanation is one example of how an evolutionary theory of disgust can illuminate some of the subtler details of disgust in consumer psychology.

Evolutionary Insights to Disgust

Recent research on disgust has embraced an evolutionary (or adaptive functionalist) model (Tybur et al., 2009). This model contains three domains, each with distinct, adaptive functions. A major difference between this model and the Rozin et al. (2000) model is that each domain is derived from evolutionary theory. In other words, each domain is considered in terms of its adaptive function (how it would ultimately influence biological fitness). Given that disgust tends to surface in the presence of a) things that could make us sick, b) sexual opportunities

we're likely to regret, and c) norm-violators that exploit innocent people, Tybur et al. (2009) suggests that disgust is an adaptation to minimize the likelihood of a) getting sick, b) mating with suboptimal partners, and c) having your social or material resources stolen. These proposed functions are generally simpler and more intuitive than the more dubious, overlapping functions proposed by Rozin et al. (2000) (e.g. protecting one's soul). Furthermore, they each map onto one of Saad's (2007, 2011) aforementioned adaptive modules. Sexual disgust fits within the reproductive module, moral disgust within the reciprocity module, and pathogen disgust within the survival module. Finally, the subdomains of the evolutionary model (pathogen, moral, and sexual) have been empirically validated as independent constructs (Tybur et al., 2009). Recall that the same cannot be said of the Rozin model. The Rozin scale can only be interpreted as a general unidimensional measure of sensitivity to disgust.

The evolutionary model can add depth to the existing literature on disgust by distinguishing between the three domains of disgust. Within the marketing literature, investigations of disgust have dealt almost exclusively with pathogen disgust; leaving the influences of moral and sexual disgust completely unaddressed. In the following two studies we test two sets of hypotheses to examine how the Three Domain Disgust Model influences the consumer experience. In the first study, we examine how activation of disgust within a specific domain (pathogenic, moral, or sexual) can result in reduced evaluations of specific categories of products within these domains. In other words, will a pathogenically disgusting cue (a smelly person) lead to more pathogen-avoidant consumption patterns (such as avoiding second-hand clothing stores, or crowded, germ-filled buffets)? In the second study, we examine interpersonal influences of disgust by examining how disgusting t-shirts elicit adaptive attributions about, and avoidance of their wearer. Hence, whereas in the first study the goal is to establish how triggers

of disgust affect product evaluations, the second study tackles how such triggers affect our perceptions of individuals.

STUDY 1

The purpose of study 1 is to demonstrate that the influence of disgust on product evaluations depend upon the domain under which the disgust was elicited. In the following sections we provide a theoretical foundation for each domain of disgust, posit several hypotheses, and describe how we test them in our first study.

HYPOTHESIS DEVELOPMENT

Pathogen disgust

Pathogen disgust is an emotional and behavioural defense system that motivates the avoidance of contact with (and especially the ingestion of) pathogens (Tybur et al., 2009). It is this system that is responsible for common human aversions to infectious material such as rotten meat or bodily fluids like feces and blood. It is universal across cultures (Ekman, 1972), and solves the evolutionarily recurrent problem of avoiding infectious microorganisms (Curtis, Aunger, and Rabie, 2004; Maynard Smith, 1978; Oaten, Stevenson, and Case, 2009; and Tooby, 1982). Pathogen disgust has also been called a “behavioral immune system” (Schaller, 2006), and “intuitive microbiology” (Pinker, 1997).

In the marketplace, certain products (such as raw food, or used clothing) conduct pathogens more readily than others (i.e. new fashion accessories like sunglasses and bracelets or electronic software/media), and as such are more "pathogenically threatening." Adaptively speaking, consumers who have recently been pathogenically disgusted may be more avoidant of potentially infectious material. Thus, we posit that consumers under the influence of pathogen disgust might evaluate pathogenically threatening products more negatively than morally or sexually threatening products.

H1: Pathogen disgust negatively influences product evaluation for product categories that convey pathogenic threat, but not for product categories that convey moral or sexual threat.

Sexual disgust

Sexual disgust is an emotional and behavioural defense system that motivates avoidance of sexual contact with reproductively costly mates, and reproductively costly behaviours (Tybur et al., 2009). This system is responsible for the revulsion one feels towards the notion of receiving sexual attention from an undesirable person (a family member or a very unattractive individual). In the marketplace, certain products and services increase one's chance of being exposed to potentially unsuitable mates (dating websites), engaging in risky sexual behaviour (sex toys, Catania et al., 1990), or engaging in uncommitted sexual behaviour (contraception, Clark, 2004). Such products are more "sexually threatening" than others. Adaptively speaking, consumers who have recently been sexually disgusted may be more avoidant of sexually threatening products. Thus, we posit that consumers under the influence of

sexual disgust might have a more negative evaluation of these products than they do towards pathogenically or morally threatening products.

H2: Sexual disgust negatively influences product evaluation for product categories that convey sexual threat, but not moral or pathogen threat.

Moral disgust

Moral disgust is an emotional and behavioral defense system that motivates avoidance of norm-violating individuals (Tybur et al., 2009; Schaich Borg et al., 2008). This system underpins our aversion towards lying, cheating, or stealing. In the marketplace, counterfeit products are the result of the theft of intellectual property and are usually fabricated because the authentic product is desirable, but too expensive. So not only is the product deceptive, but so is the consumer who wears it. Another product category that is acquired through the theft of intellectual property is pirated electronic media (via .torrent files or peer-to-peer file sharing). These product categories threaten the moral concepts of honesty and fairness, and thus, are morally threatening. Adaptively speaking, consumers who have recently been morally disgusted may be more avoidant of such morally threatening products. As such, we propose that individuals under the influence of moral disgust might have reduced evaluations of products which are the result of theft.

H3: Moral disgust negatively influences product evaluation for product categories which are morally threatening, but not sexually or pathogenically threatening.

We also suspect that moral disgust may influence charitable donations. Individuals who are morally disgusted may seek to reduce their feelings of moral disgust by engaging in a morally admirable act, such as donating to a charity. If this is the case, we expect morally disgusted individuals to have more positive attitudes towards charitable giving. However, moral disgust may also activate a fear of duplicity. If so, then morally disgusted individuals may be suspicious of the motives of charities and thus, have a reduced attitude towards charitable donations. Either way, we make no a priori predictions in regard to charitable donations.

Disgust Sensitivity

In our study, we utilize a model of disgust sensitivity that contains three domains (pathogen, moral and sexual). Each domain varies independently within and across individuals, and captures the extent to which an individual feels any of the three forms of disgust in the presence of triggering stimuli. For example, when faced with the decision to either eat or throw out old leftovers, an individual with a very strong immune system need not be as cautious as an individual with a very weak immune system, and is less likely to feel disgusted and reject the leftovers (Faulkner et al., 2004; Tybur et al., 2009). This is because exposure to germs is simply not as costly to the immunologically robust individual. In line with this reasoning, Tybur et al. (2009) find that individuals with high perceived vulnerability to disease are also highly sensitive to pathogenic disgust. In the same way that exposure to germs imposes different immunological costs for different people, having sex imposes different costs as well. Nowhere is this more true than when one compares the sexes.

In biology, the classification of sex is done by simply looking for the sex that has the larger gametes (reproductive cells). The individuals carrying the larger, more energetically costly gametes (the eggs) are female, and those with the smaller, cheaper gametes (sperm) are male. Not only do females pay a greater 'upfront' cost in the production of larger, more expensive gametes, but in most species they also gestate and raise offspring. From this perspective, one can appreciate just how risky and expensive the act of sex is for a female relative to a male, which is useful in understanding why women tend towards selectivity when choosing sexual partners (Trivers, 1972). Conversely, because the consequences of sexual promiscuity are much lower for males, the same theory explains why men tend to be more accepting of non-committed sexual flings (Guéguen, 2011; Saad et al., 2009). Given the cost asymmetry of promiscuity between males and females, it is adaptive for females to be more sensitive to sexual disgust than males (and they are, cf. Tybur et al., 2009). Finally, individuals also vary in the extent to which they are willing to exploit and/or abuse those around them. Given that high moral disgust sensitivity could interfere with self-interested, anti-social behaviour, individuals who pursue highly exploitative strategies in their social lives should have low moral disgust sensitivity (Tybur et al., 2009). To this end, Tybur et al. (2009) found that moral disgust was negatively linked to primary psychopathy and positively linked to the agreeableness dimension of the Big-5 personality test.

Despite the seemingly universal benefit of avoiding pathogens, sex with people who are extremely ugly or genetically related to you, and social cheaters, individuals vary in their immunocompetence, sexual strategies, and social strategies. As such, sensitivities should vary across individuals, situations, and environments in order to produce optimal behaviour at the individual level. We expect that these individual differences will moderate the influence of

activated disgust on product evaluations such that reductions in product evaluations will be particularly strong as sensitivity increases.

H4a: The postulated effect in H1 will be stronger as pathogen disgust sensitivity increases.

H4b: The postulated effect in H2 will be stronger as sexual disgust sensitivity increases.

H4c: The postulated effect in H3 will be stronger as moral disgust sensitivity increases.

METHOD

Study 1 was a 3 (activated disgust, between-subjects: pathogen, sexual, or moral) x 3 (disgust sensitivity, within-subjects: pathogen, sexual, and moral) mixed design. Our original sample (n = 196) was an online panel of North American adults, but contained sixteen responses that were incomplete. Removing these yielded a final sample (n = 180; 57% female; average age of forty-six). They were predominantly self-identified as Caucasian (91%). Participants were recruited through an online panel service offered by Qualtrics.com. All participants were asked to read a short story (approximately 90 words) that contained pathogenically, sexually, or morally disgusting elements (see Appendix for the three primes). The goal of each prime was to elicit domain-specific feelings of disgust. In order to insure that our primes were doing precisely this, we ran a pretest.

Pretest

32 participants were recruited through email to fill out an online pretest survey hosted by Qualtrics.com. The pretest was divided into three sections (sexual, moral, and pathogen), and the order of the sections was randomized for each subject. Each section contained a prime and a six-item measure of domain-specific feelings of disgust (see Appendix X). This scale asked the extent to which each prime "made them feel" the following six feelings (with 0 labeled "not at all" and 9 labeled "extremely"): sexually repelled, romantically repulsed, ethically revolted, morally offended, hygienically sickened, and grossed-out by germs (i.e., two feelings elicited for each of the three domains of disgust). The first two items were combined into a sexual disgust measure ($\alpha = .93$), the second two items into a moral disgust measure ($\alpha = .63$), and the last two into a pathogenic disgust measure ($\alpha = .87$). As indicated in Table 1, the pretest revealed that mean domain-specific feelings of disgust were significantly different across all three primes. In order to test for significant differences between each prime, planned contrasts were run (see Table 2). These results suggest that our primes worked as intended. That is to say; they performed well at eliciting feelings of disgust within the target domain to a greater extent than the non-target domains, and constitute a legitimate operationalization of our underlying construct. Thence, we used these primes in study 1. However, we did notice that the moral and pathogen primes included a male character, while the sexual prime included a gender-neutral character. In an effort to eliminate the potentially confounding influence of gender within the primes, gender cues were eliminated from all three primes prior to their use in study 1.

Table 1: Pretest Means (Standard Deviations) and F-scores of Domain-Specific Feelings of Disgust across Domain-Specific Primes

	Prime				
	Sexual	*Moral*	*Pathogen*	F	*p*
Feelings					
Sexual Disgust	6.23 (2.68)$_{MP}$	2.84 (3.66)$_{S}$	3.73 (3.94)$_{S}$	7.98	.001
Moral Disgust	2.48 (2.19)$_{MP}$	7.09 (2.35)$_{SP}$	1.47 (1.95)$_{SM}$	60.59	.001
Pathogen Disgust	3.08 (2.85)$_{MP}$	0.58 (1.33)$_{SP}$	8.13 (1.33)$_{SM}$	122.94	.001

NOTE – Across rows, subscripts indicate which other means a given mean is significantly different from (as determined by planned contrasts). For instance, "$_{MP}$" indicates that the feelings of disgust in the sexual condition are significantly different from those in the moral ($_{M}$) and the pathogen ($_{P}$) condition ($p < .05$).

Table 2: Pretest Planned Contrasts for Domain-Specific Feelings of Disgust across Domain-Specific Primes

Prime Comparisons	*t*	df	*p*
Sexual Feelings of Disgust			
Sexual - Pathogen	2.844	92	.005**
Sexual - Moral	3.861	92	.001**
Pathogen - Moral	1.025	92	.308
Moral Feelings of Disgust			
Sexual - Pathogen	1.822	90	.001**
Sexual - Moral	-8.287	90	.072*
Pathogen - Moral	-10.367	90	.001**
Pathogen Feelings of Disgust			
Sexual - Pathogen	-10.210	92	.001**
Sexual - Moral	5.065	92	.001**
Pathogen - Moral	15.398	92	.001**

Main Study

In study 1, participants were randomly assigned to either a sexual, moral, or pathogenically disgusting group. This determined which prime they would read before filling out our survey. After reading the prime, participants were asked to evaluate a variety of product categories, as well as indicate their purchase or usage intentions for said products. This section of the survey began with the text: "Now, we'd like you to evaluate some possible behaviours.

For this next study, please rate the behaviours according to how you feel about them…" We included three product categories per domain, for a total of nine dependent variables. The pathogenically threatening product or service measures were: i) "...going to the hospital to diagnose a severe fever (urgent care, emergency room, etc.)?" ii) "…purchasing used or second-hand clothing (from a garage sale, a thrift store, etc.)?" and iii) "…eating at an all-you-can-eat buffet (salad bar, Chinese buffet, etc.)?" The sexually threatening products and services were: i) "...using dating services (speed dating, online dating, etc.)?" ii) "...purchasing sexual products (lubricant, hand-cuffs, etc.)?" and iii) "...using contraceptive methods (condoms, the pill, etc.)?" The morally threatening products and services were: i) "…donating to charities (UNICEF, Red Cross, etc.)?" ii) "…purchasing illegal counterfeit fashion items (watches, sunglasses, bags, etc.)?" iii) "…downloading pirated material (movies, music, software, etc.)?" For each of these consumption behaviours, participants provided evaluations. These were recorded on a seven-point, three-item scale (Dislike/Like, Undesirable/Desirable, Negative/Positive, all Cronbach αs > .93). Finally, participants filled out the Three Domain Disgust Scale (TDDS, Tybur et al., 2009), manipulation check items, and demographic information.

RESULTS

As a manipulation check, participants were again given the domain-specific feelings of disgust scale that was used in the pretest. The item reliability was good (α = .931 for feelings of sexual disgust, =.891 for moral, and = .954 for pathogen), and the manipulation check suggested that our primes worked as intended. We used an ANOVA to check for differences in mean

domain-specific feelings of disgust with disgust type (as induced by the different primes) as the independent variable. This analysis confirmed that mean differences between the three primes were significant. To confirm the direction of these mean differences, planned contrasts were performed. The contrasts revealed that each domain elicited the target domain of disgust to a greater extent than the non-target domains (See Tables 3 and 4).

Table 3: Study 1 Means (Standard Deviations) and F-scores of Domain-Specific Feelings of Disgust across Conditions

	Prime				
	Sexual	*Moral*	*Pathogen*	F	*p*
Feelings					
Sexual Disgust	4.84 $(2.22)_{M}$	3.03 $(2.17)_{SP}$	4.87 $(2.28)_{M}$	13.41	.001
Moral Disgust	4.47 $(2.23)_{MP}$	5.50 $(1.57)_{SP}$	3.52 $(1.94)_{SM}$	15.79	.001
Pathogen Disgust	3.80 $(2.29)_{MP}$	2.58 $(2.07)_{SP}$	5.84 $(1.48)_{SM}$	41.79	.001

Table 4: Planned Contrasts for Mean Feelings of Pathogenic Disgust

Prime Comparisons	*t*	df	*p*
Sexual Feelings of Disgust			
Sexual - Pathogen	-.067	177	.947
Sexual - Moral	4.451	177	.001**
Pathogen - Moral	4.536	177	.001**
Moral Feelings of Disgust			
Sexual - Pathogen	2.704	177	.008**
Sexual - Moral	-2.916	177	.004**
Pathogen - Moral	-5.620	177	.001**
Pathogen Feelings of Disgust			
Sexual - Pathogen	-5.668	177	.001**
Sexual - Moral	3.378	177	.001**
Pathogen - Moral	9.036	177	.001**

H1 proposed that becoming pathogenically disgusted would reduce evaluations for products that conveyed pathogen threat. As mentioned, we tested this with three dependent

measures (for brevity, I'll refer to these as: hospital, used clothing, and buffet). To test for significant differences in mean evaluations based on disgust type, we ran an ANOVA for each pathogenically threatening product with disgust type as the independent variable. As indicated in Table 5, the ANOVAs revealed no significant differences in mean evaluations for used clothing or hospitals across disgust types ($F(2, 177) = .478$, $p < .621$, $F(2, 177) = 1.917$, $p < .15$, respectively). However, buffet evaluations were moderately influenced by disgust type ($F(2, 177) = 2.366$, $p < .097$, see Table 5). To confirm the direction of these differences, planned contrasts were run (see Table 6). The contrasts were conducted as part of the ANOVA in order to control for familywise error rates. The mean buffet evaluation in the sexual condition was significantly lower than in the pathogen condition ($t(177) = -2.009$, $p < .05$) and moderately lower in than the moral condition ($t(177) = -1.727$, $p < .09$). The mean evaluations in the pathogen and the moral condition were not significantly different ($t(177) = 0.267$, *ns*). This pattern of results suggests sexual disgust (and not the predicted pathogen disgust) reduced evaluations of buffets. Thus, the data fail to support H1.

Table 5: Means (Standard Deviations) and F-scores for Pathogenically Threatening Product Evaluations

	Disgust Type				
	Sexual	*Moral*	*Pathogen*	F	*p*
Used Clothing	5.03 (1.78)	4.97 (1.88)	4.71 (2.05)	0.479	0.621
Hospitals	3.64 (2.03)	4.15 (2.11)	4.37 (2.17)	1.917	0.15
Buffet	$5.14\ (1.95)_{MP}$	$5.70\ (1.73)_{S}$	$5.79\ (1.63)_{S}$	2.366	0.097*

Table 6: Planned Contrasts for Buffet Evaluations

Disgust Condition Comparison	*t*	df	*p*
Sexual - Pathogen	-2.009	177	0.046**

Sexual - Moral	-1.727	177	0.086*
Pathogen - Moral	0.267	177	0.79

H2 proposed that becoming sexually disgusted would reduce evaluations for products that convey sexual threat. The three dependent variables used to test this were: dating services, sexual products, and contraceptives. To test for significant differences in mean evaluations based on disgust type, we ran an ANOVA for each sexually threatening product with disgust type as the independent variable (see Table 7). The ANOVA revealed no significant differences in mean evaluations for dating services or sexual products across disgust types ($F(2, 177) = .048$, $p < .953$, $F(2, 177) = 1.534$, $p < .219$, respectively). However, contraceptive evaluations were moderately influenced by disgust type ($F(2, 177) = 3.029$, $p < .051$). To confirm the direction of these differences, planned contrasts were run. As before, these compared the mean evaluation within each domain to each other domain (sexual versus pathogen, sexual versus moral, pathogen versus moral, see Table 8). The planned contrasts revealed that mean contraceptive evaluation in the moral condition was significantly higher than in the sexual condition ($t(177) = -2.302$, $p < .03$) and moderately higher than the pathogen condition ($t(177) = -1.916$, $p < .06$). This pattern of results suggests that moral disgust increased the evaluation of contraceptives. Our prediction was that evaluations of contraceptives would be lowest in the sexual domain. Therefore, the data do not support H2.

Table 7: Means (Standard Deviations) and F-scores for Sexually Threatening Product Evaluations

	Disgust Type				
	Sexual	*Moral*	*Pathogen*	F	*p*
Dating Services	3.02 (1.87)	3.11 (1.85)	3.02 (1.98)	0.048	.953
Contraceptives	$4.62\ (2.13)_{M}$	$5.45\ (1.79)_{SP}$	$4.76\ (1.99)_{M}$	3.029	.051*
Sexual Products	3.86 (2.20)	4.54 (2.06)	4.11 (2.11)	1.534	.219

Table 8: Planned Contrasts for Contraceptive Evaluations

Disgust Condition Comparison	*t*	df	*p*
Sexual - Pathogen	-0.397	177	0.692
Sexual - Moral	-2.302	177	0.022**
Pathogen - Moral	-1.916	177	0.057*

H3 proposed that becoming morally disgusted would reduce evaluations for products that convey moral threat. The two dependent measures used to test this were pirated products and counterfeit products. Recall that we also thought that moral disgust may influence evaluations of charities, but we did not assert a hypothesis as there were compelling arguments that could be made for an effect in either direction. To test for significant differences in mean evaluations of pirated products, counterfeit products, and charitable donations based on disgust type, we ran an ANOVA for each of these dependent measures, with disgust type as the independent variable (see Table 9). Disgust type yielded significant differences for pirated products ($F(177) = 3.807$, $p < .03$), and moderately significant differences for counterfeit products ($F(177) = 2.615$, $p < .08$), as well as charities ($F(177) = 2.435$, $p < .1$). In order to confirm the direction of these differences, planned contrasts were run. As before, these compared the mean evaluation under one domain to the mean evaluation under each other domain (sexual versus pathogen, sexual versus moral, pathogen versus moral, see Table 10). The planned contrasts revealed that, opposite of our predictions, moral disgust significantly enhanced (instead of reduced) evaluations of pirated products compared to both sexual ($t(177) = -2.203$, $p< .01$) and pathogen ($t(177) = -2.642$, $p < .05$) disgust. Additionally, mean evaluations of counterfeit products were significantly higher under moral disgust when compared to pathogen disgust ($t(177) = -2.282$, $p < .03$), but not sexual disgust ($t(177) = -1.030$, $p < .31$). Evaluations of charities under moral disgust were not significantly different from either

pathogen disgust (*t* (177) = -1.147, p < .21) or sexual disgust (*t* (177) = -.851, p < .37). However, an unexpected difference in charity evaluations emerged between sexual and pathogen disgust (*t* (177) = -2.203, p < .03). We explore why this might have occurred in the discussion.

Table 9: Means (Standard Deviations) and F-scores for Morally Threatening Product Evaluations

	Disgust Type				
	Sexual	*Moral*	*Pathogen*	F	*p*
Pirated Products	2.22 (1.74)$_{M}$	2.86 (1.96)$_{SP}$	2.02 (1.52)$_{M}$	3.807	.024**
Counterfeits	2.11 (1.56)	2.41 (1.70)$_{P}$	1.75 (1.43)$_{M}$	2.615	.076*
Charities	5.63 (1.47)$_{P}$	5.86 (1.34)	6.15 (1.10)$_{S}$	2.435	.091*

Table 10: Planned Contrasts for Morally Threatening Product Evaluations

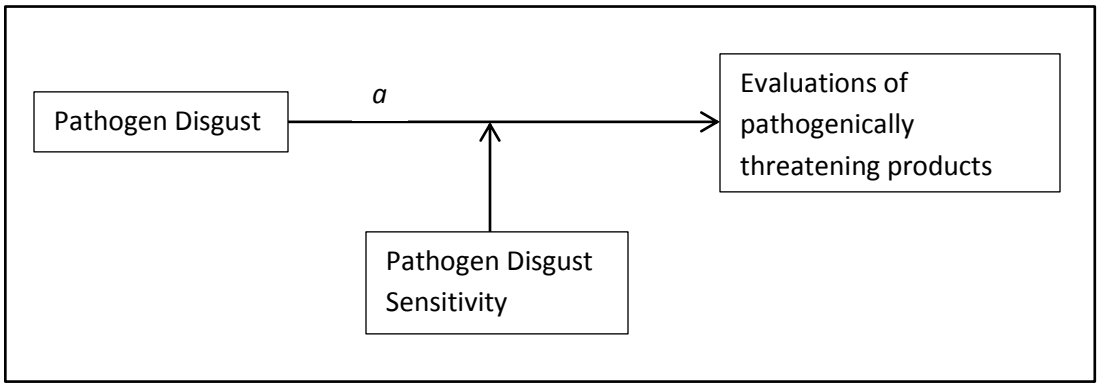
Disgust Condition Comparison	*t*	df	*p*
Pirated Products			
Sexual - Pathogen	0.614	177	0.540
Sexual - Moral	-2.023	177	0.045*
Pathogen - Moral	-2.642	177	0.009**
Counterfeits			
Sexual - Pathogen	1.254	177	0.212
Sexual - Moral	-1.030	177	0.305
Pathogen - Moral	-2.282	177	0.024*
Charities			
Sexual - Pathogen	-2.203	177	0.029*
Sexual - Moral	-.851	177	0.361
Pathogen - Moral	-1.147	177	0.201

H4 proposed that the relationships predicted in H1, H2, and H3 would be moderated by individual differences in pathogen, sexual, and moral disgust sensitivity, respectively. More

specifically, we predicted that the hypothesized negative effects would be stronger among more sensitive individuals. For this analysis, the condition variable was re-coded. We changed condition from a categorical variable with three levels (disgust type: sexual, moral, pathogen) to three binary variables with on/off levels (sexual disgust: 0/1, moral disgust: 0/1, pathogen disgust: 0/1). For instance, individuals in the sexual disgust condition would be coded as follows: sexual disgust 1, moral disgust 0, and pathogen disgust 0. Thus, when sexual disgust is entered as an independent measure, it collapses both moral and pathogen disgust into one condition. This allowed us to test the influence of one prime at a time.

Moderation analyses were conducted a la Baron and Kenny (1986). Essentially, a moderation analysis is used to investigate whether or not the nature of a main effect is changed at different levels of a third variable. For example, our hypothesized main effect of pathogen disgust on evaluations of pathogenically threatening products (path *a* in Figure 1) might be different at low versus high levels of a third variable (pathogen disgust sensitivity). In other words, path *a* might be insignificant when pathogen disgust sensitivity is low, but negative when pathogen disgust sensitivity is high. Importantly, a main effect need not be present for a moderating effect to be observed. It could be that the influence of pathogen disgust on evaluations of pathogenically threatening products is only clear for individuals who are highly sensitive to pathogen disgust. This would introduce noise into the main effect, and might lead to a false null result. Including the moderating variable reduces this noise, and provides more insight into the nature of the relationship between the independent and dependent variables.

Figure 1: Moderation Model



In our study, we investigated the moderating influence of three individual differences variables: pathogen disgust sensitivity, sexual disgust sensitivity, and moral disgust sensitivity. All three dimensions were captured using the Three Domain Disgust Scale (which has been empirically validated as a robust, multidimensional scale by Tybur et al., 2009). The scale consists of twenty-one items (seven per domain). The means, standard deviations, and Cronbach's alphas for each domain are provided in Table 11 below. All scale reliabilities were good, and could not be improved by item deletion. Thus, responses were collapsed into their respective domains.

Table 11: Means, Standard Deviations, and Scale Reliability for Domain-Specific Disgust Sensitivity in Study 1

Domain	M	SD	α
Sexual	4.265	1.687	.88
Moral	5.741	1.296	.90
Pathogen	5.356	1.093	.81

H4 predicted that the negative effect of pathogen disgust on evaluations of pathogenically threatening products or services (H1) would be especially strong for individuals who are sensitive to pathogen disgust. Again, this was tested three times, once per dependent measure (evaluations of hospitals, used clothing, and buffets). To conduct a moderation analysis, an 'interaction term' was created by multiplying the independent measure (pathogen disgust: 0/1) by the moderator (pathogen disgust sensitivity: a continuous measure). Then, all three variables (the independent, moderator, and the interaction term) were entered into linear regressions on evaluations of hospitals, used clothing, and buffets. If the regression shows that the interaction term is a significant predictor on those evaluations, then the moderating hypothesis is supported.

The interaction term (pathogen disgust x pathogen sensitivity) significantly predicted hospital evaluations ($t = 2.565$, $p < .02$), but not used clothing or buffets (all ps > .5). Thus, the 'null' effect of disgust type on hospital evaluation was qualified by individual differences in pathogen disgust sensitivity. As sensitivity to pathogen disgust increased, hospital evaluations also increased, but only when participants were exposed to a pathogenic stimuli. While this interaction is significant, we hypothesized that it would produce results in precisely the opposite direction (highly pathogenically sensitive individuals would be more likely to avoid hospitals when primed with a pathogenically disgusting cue). Thus, we fail to support H4a. We discuss potential explanations for this reverse effect in the discussion section.

H4b predicted that the negative effect of sexual disgust on evaluations of sexually threatening products or services (H2) would be especially strong for individuals who are sensitive to sexual disgust. This was tested using evaluations of dating services, sex products, and contraceptives. The interaction term (sexual disgust x sexual sensitivity) moderately

predicted evaluations of dating services (t= -1.688, p < .1), but not sex products (p > .27), or contraceptives (p > .60). This means that as sensitivity to sexual disgust increased, evaluations of dating services decreased, but only for subjects who were exposed to a sexually disgusting prime. Previous research has shown that sexual disgust sensitivity is considerably higher in women than in men (Tybur et al., 2009, 2011). This was also true in our sample (M_{male} = 3.37, M_{female} = 4.91, t = 6.71, p < .001). Thus, we re-ran these analyses after splitting the sample by sex. Among men, the interaction term significantly predicted evaluations of dating services (t = -2.143, p < .04), and moderately predicted evaluations of sexual products (t = -1.726, p < .09), but did not predict attitudes towards contraceptives (p > .89). As before, this suggests that attitudes towards sexual products and dating services were negatively related to sexual disgust sensitivity, but only for males who had been exposed to the sexually disgusting prime. Among women, no interaction effects emerged (all ps > .6). Thus, we find some split evidence to support H4b.

Finally, H4c predicted that the negative effect of moral disgust on evaluations of morally threatening products or services (H3) would be especially strong for individuals who are sensitive to moral disgust. This was tested using evaluations of counterfeit and pirated products. The interaction term (moral disgust x moral sensitivity) produced no significant effects on either counterfeit products (t = 0.489, p <.63) or pirated products (t = 0.230, p < .82). Our exploratory variable (charities) was also subjected to a moderation analysis. This analysis also produced no significant interaction effect (t = 0.299, p < .765). Thus, we find no support for H4c.

DISCUSSION

The results of study 1 failed to confirm our predictions. Chiefly, the pathogen, sexual and moral primes only produced unanticipated results. We predicted that specific domains of disgust would have a negative influence on product categories that represented threats within those domains. Instead, we found that sexual disgust had a negative influence on buffet evaluations (a pathogenically threatening product category), pathogen disgust had a mildly positive effect on evaluations of charities, and moral disgust had positive effect on attitudes towards pirated and counterfeit products. The moderation results offered little consolation, except in the case of sexual disgust. There are several possible explanations for these lackluster findings.

One possibility with any null result is that our theorizing is wrong and disgust does not influence product evaluations at all or not as we surmised. Given several methodological limitations in the design of our study, we think that this is the likely operative explanation. One such limitation is that our manipulation check may have been so obvious that it produced demand characteristics. Given the rather straightforward measures of domain-specific feelings of disgust, participants were able to infer what the goal of the survey was. In a sense, the strength of the manipulation check results were likely a consequence of participants giving us what we wanted, and not a representation of their true feelings.

Another potential explanation for the lack of findings in general is that we did not utilize a contamination protocol. A contamination protocol links the disgust-evoking stimuli to the target stimuli by contaminating it in some way (usually touch) (Argo et al., 2006; Morales and Fitzsimons, 2007; Mishra, 2009). Recall that in our study, we sought to induce a feeling of disgust with a prime and then observe how that feeling influenced product evaluations. Importantly, the eliciting stimulus did not contaminate the evaluated stimulus. Since this is a

possible explanation for our null findings, we adopt a more direct contamination approach in our second study.

Another possible reason for some of our null effects is that the products which we thought would be sexually threatening may not have been. We think this applies to sexual products and contraceptives. We had argued that sexual products promoted risky sexual behaviour, and contraceptives promoted uncommitted sexual behaviour. Upon further consideration, these items may not have been wise choices. In fact, married couples often use both to increase the frequency and pleasure of sexual activity with one another.

However, these explanations cannot account for the significant (and unexpected) positive link between the moral prime and positive attitude towards illegal counterfeits and pirated software. These results probably surfaced as a result of a "moral licensing" effect. Moral licensing refers to the rather counterintuitive but compelling finding that individuals who feel morally superior to others also feel less obliged to act morally in a subsequent task (Cain, Loewenstein and Moore, 2005; Monin and Miller, 2001). In the same way that individuals who have just received a large sum of money are more likely to purchase material indulgences, those who receive assurance of their moral superiority are more likely to pursue immoral indulgences. In a sense, their moral superiority gives them license to behave immorally. Our moral prime involved an individual who behaved immorally. Subjects who read this prime (versus the other two primes) were likely to feel morally superior to the character in the story. Consequently, they may have felt entitled to a temporary immoral indulgence.

Another reason for the weak results could have been that the primes activated multiple domains of disgust at the same time. While our manipulation check suggests that we succeeded in activating the target domain to a greater extent than the non-target domains, even partial activation of the non-target domains could have contaminated our findings. For example, the

sexual prime might arouse concerns related to sexually transmitted infections, which could elicit pathogenic feelings of disgust. Additionally, the sexual prime describes a character that is unusually forward about their rather deviant sexual behaviour, which may have elicited moral feelings of disgust. Thus, even if domain-specific feelings of sexual disgust produced domain-specific reductions in product evaluations, the confounded nature of the primes would have washed out any observable effects. The inclusion of a control condition could have been informative as to the actual function of the prime. For instance, we would expect that a domain-specific disgusting prime would elicit greater degrees of domain-specific disgust than the control. However, if the prime also elicited significantly greater degrees of disgust in the non-targeted domains, then we could confirm that cross-activation was indeed occurring.

In sum, it is hard to draw conclusions from our first study. Given the failure of the manipulation tests, it is possible that our weak results were the consequence of poor operationalization. In our second study, we attempt to address these issues.

STUDY 2

The purpose of study 2 was twofold. First, we wanted to address some of the flaws in study 1 that may have been responsible for our weak results. To reiterate, the null effects of study 1 may have emerged because the disgusting stimuli were irrelevant to the dependent measures. In study 2, we address this issue by insuring that the disgusting stimuli are explicitly linked to our dependent measures. Contamination theory suggests that the properties of one object can be transferred to another object by mere touch. In study 2, our hypotheses reflect the role of contamination in the production of disgust and aversion.

The second reason for running study 2 was more theoretical. Previous work on disgust in marketing has demonstrated that product evaluations are usually lowered as a result of contact with consumers (Argo et al., 2006), or contact with disgusting products (such as tampons or lard) (Morales and Fitzsimons, 2007; Mishra, 2009). Essentially, consumers can contaminate products, and products can contaminate products. However, no study has yet examined whether or not products can contaminate their users. For instance, will a t-shirt with a pathogenically disgusting image or slogan lead to more negative pathogenic (versus sexual and moral) attributions towards the wearer? We believe so. In fact, we hypothesize that this character contamination effect will affect not only domain-specific attributions towards the contaminated person but also encourage them to avoid the target in specific, adaptive ways. In other words, a pathogenically contaminated person ought to elicit higher degrees of avoidance in situations where germ transmission is likely, and a morally contaminated person ought to elicit higher degrees of avoidance when material resources are at stake. For example, we expect people to be more willing to share a straw with the morally contaminated person than the pathogenically contaminated person, and more willing to lend money to the pathogenically contaminated person than the morally contaminated one. We call this "domain-specific avoidant behaviour." We expect participants' avoidance strategies to be either germ-avoidant (when pathogenically disgusted), reciprocity-avoidant (when morally disgusted), or romance-avoidant (when sexually disgusted). We also expect that this effect will be driven by attributions. For example, the sexually contaminated individual is more likely to be seen as "unsexy" than "untrustworthy" or "unclean." We call this "domain-specific attribution."

HYPOTHESIS DEVELOPMENT

Pathogen disgust

As posited in study 1, pathogen disgust is an adaptation for avoiding contact with potentially infectious material. We hypothesized that the pathogenically disgusting experience would lead to an avoidance of pathogenically (but not morally or sexually) threatening products. In study 2, we suggest that it should also lead to domain-specific avoidant behaviour. Given three domains of disgust, it follows that there might to be three domains of avoidance. In other words, one cannot always avoid a pathogenic threat with the same behaviour as a sexual or a moral threat. We call these germ-avoidant, reciprocity-avoidant, and romance-avoidant behaviour. For instance, individuals who have been contaminated by pathogenically disgusting stimuli may arouse germ-avoidant (but not reciprocity-avoidant or romance-avoidant) behaviour in participants. We think that this main effect could be explained by negative attributions about the hygiene (but not the morality or the attractiveness) of the contaminated person.

H1: **a)** Pathogenically disgusting t-shirts will elicit greater levels of germ-avoidant behaviour than reciprocity-avoidant behaviour or romance-avoidant behaviour.

b) The main effect in H1a is mediated by negative hygiene attributions about the wearer.

Sexual disgust

As posited in study 1, sexual disgust is an adaptation for avoiding sex with potentially unsuitable mates. In study 1, we hypothesized that the experience of sexual disgust would lead to an avoidance of sexually threatening products. In study 2, we suggest that it could also lead

to domain-specific avoidant behaviour. Thus, individuals who have been contaminated by sexually disgusting stimuli may arouse romance-avoidant (but not reciprocation-avoidant or germ-avoidant) behaviour in participants. We think that this main effect could be explained by negative attributions about the attractiveness (but not the morality or the hygiene) of the contaminated person.

H2: **a)** Sexually disgusting t-shirts will elicit greater levels of romantically-avoidant behaviour than germ-avoidant behaviour or reciprocity-avoidant behaviour.

b) The main effect in H2a is mediated by negative attractiveness attributions about the wearer.

Moral disgust

As posited in study 1, moral disgust is an adaptation for avoiding reciprocity with potential non-reciprocators. In study 1, we hypothesized that the experience of moral disgust would lead to an avoidance of morally threatening products. In study 2, we suggest that it could also lead to domain-specific avoidant behaviour. Thus, individuals who have been contaminated by morally disgusting stimuli may arouse reciprocation-avoidant (but not romance-avoidant or germ-avoidant) behaviour in participants. We expect that this main effect may be explained by negative attributions about the attractiveness (but not the morality or the hygiene) of the contaminated person.

H3: **a)** Morally disgusting t-shirts will elicit greater levels of reciprocity-avoidant behaviour than germ-avoidant behaviour or romance-avoidant behaviour.

b) The main effect in H3a is mediated by negative morality attributions about the wearer.

Disgust Sensitivity

As in study 1, disgust sensitivity captures the extent to which an individual feels disgust in the presence of triggering stimuli. Disgust sensitivity has three distinct dimensions (pathogen, moral, and sexual) along which individuals vary somewhat independently (Tybur et al. 2009). A person can be highly sensitive in one domain, but highly tolerant in others. We propose that individuals who are particularly sensitive in one domain are more likely to make negative character attributions in that same domain. For example, someone who cannot tolerate even the slightest hint of germs is more likely to accuse someone wearing a dirty shirt of being unhygienic than someone who is relatively unfazed by eating food off of the floor.

H4: **a)** Pathogenically disgusting t-shirts will elicit more negative hygienic attributions (regarding the wearer of the t-shirt) from individuals who are sensitive to pathogenic disgust.

b) Sexually disgusting t-shirts will elicit more negative sexual attributions (regarding the wearer of the t-shirt) from individuals who are sensitive to sexual disgust.

c) Morally disgusting t-shirts will elicit more negative moral character attributions (regarding the wearer of the t-shirt) from individuals who are sensitive to moral disgust.

METHOD

Study 2 was a 3 (t-shirt disgust, between-subjects: pathogen, moral, or sexual) x 3 (disgust sensitivity, within-subjects: pathogen, moral or sexual) mixed design. In other words, subjects only saw one type of t-shirt, but filled out all three subscales of the Three Domain Disgust Scale (Tybur et al., 2009). Again, our sample consisted of an online panel of North American adults (n = 151) gathered from Qualtrics.com. Forty-nine percent of the participants were female, with an average age of 45 (SD = 13.83). They were predominantly self-identified as Caucasian (85%). All participants were shown three t-shirts from a single domain of disgust. They were asked to rate each shirt in terms of how disgusting they found them, their behavioural intentions towards someone wearing the shirts, and attributions they would assign to someone wearing the disgust-eliciting shirts. All scales were seven-point. Behavioural avoidance was measured with a six-item scale that asked "If I saw someone wearing this shirt, I would:" This scale contained six behaviours along three domains, with two items per domain,. Response scales were labelled "1 = Definitely would not," "4 = Maybe," and "7 = Definitely would." To check for response consistency, one item in each domain was reverse worded. The pathogen items read: a) "Feel comfortable drinking from the same straw they had just drank from" and b) "Not want to stand close to them on a crowded bus." The moral items read: a) "Trust them with an important password" and b) "Avoid lending them money." The sexual items read: a) "Consider going on a date with them" and b) "Think that they would not make a good romantic partner." These items exhibited extremely low reliability (all αs < .4), and thus were not combined. The items may have yielded low reliability for two primary reasons. First, it is conceivable that the items are simply not correlated to one another. The second, perhaps more likely reason is that subjects often failed to notice the wording of the reverse-scored items. In other words, they may have failed to notice the word 'not' in the sentences. We address both of

these possibilities in the discussion. To facilitate interpretation, all items were coded such that larger values indicate greater degrees of avoidance.

Subjects then answered the following question about attributions. The question read, "If I saw someone wearing this shirt, I would think they were:" and was followed by twelve randomly-ordered attribution items: trustworthy, corrupt, dependable, irresponsible, dirty, hygienic, in good physical shape, contagious, sexy, perverted, attractive, a turn-off (i.e., four attributions for each of the three domains of disgust). Items with an asterisk were reverse-coded. As with the behavioural avoidance measures, positive attributions were reverse-scored such that large scores indicate strong negative attributions. This scale was labeled "1 = Not at all," "4 = Moderately," and "7 = Extremely." The first four items composed morally-relevant attributions, the second set of four items composed the pathogenically-relevant attributions, and the final four items composed the sexually-relevant attributions. Cronbach's alphas were calculated to justify collapsing the items into composite measures. Morally-relevant attributions and sexually relevant attributions had acceptable reliabilities (αs = .71 and .69, respectively). Pathogenically-relevant attributions yielded a borderline acceptable reliability (α =.57). Typically, one would eliminate an item until reliability was improved to a more acceptable threshold (α =.6, for instance). However, removing items did not improve reliability. So despite a weak reliability, we decided to collapse pathogenically-relevant attributions and treat it as a composite measure because it was the most reliable measure of pathogenically-relevant attributions we had. See Table 14 for attribution descriptives.

As discussed, a potential limitation in our first study was that the stimuli (the primes) simultaneously activated multiple disgusts, a phenomena we coin cross-activation. One way of minimizing the impact of cross-activation is to supply multiple disgust cues. For example,

imagine three morally disgusting stimuli. So, each stimulus activates moral disgust, but stimulus A also activates pathogen disgust, stimulus B also activates sexual disgust, and stimulus C activates all three. While all three domains of disgust have been engaged, moral disgust has been engaged to a greater extent than pathogen or sexual disgust. For this reason, we included three T-shirts for each domain and had subjects only rate t-shirts within a single disgust domain. This way, any unanticipated cross-activation into the other domains can be minimized. To control for respondent fatigue, participants were randomly assigned to rate pathogenic t-shirts, moral t-shirts, or sexual t-shirts (See Appendix – Study 2 for the t-shirts).

RESULTS

Main Effects

Eleven participants had no variance in their responses and were eliminated from the analysis, leaving us with 140 respondents. The data was reorganized such that each t-shirt rating was treated as an individual respondent. Because each respondent rated three t-shirts, this gave us 140 x 3 = 420 t-shirt ratings. H1a, H2a, and H3a all proposed a relationship between a t-shirt disgust type and domain-specific avoidance behaviour. Specifically, H1a proposed that a pathogenically disgusting t-shirt would elicit more pathogen-avoidant behaviours than romance-avoidant or reciprocity-avoidant behaviour. Similarly, H2a proposed that a sexually disgusting t-shirt would elicit more romance-avoidant behaviour, and H3a proposed that a morally disgusting t-shirt would product more reciprocity-avoidant behaviour. To test these hypotheses, we must first confirm that there are differences in domain-specific avoidance between shirt

types. In order to do this an ANOVA was run with t-shirt type (sexual, moral, or pathogen) as the independent measure, and the six avoidant behaviours as dependent variables (See Table 12).

T-shirt type produced no differences in likelihood to share an important password, offer a loan, drink from the same straw, stand close to, or consider for a romantic partner (all *p*s > .26). However, t-shirt type did produce moderately significant differences in reluctance to consider for a date (M_{sexual} = 5.88, M_{moral} = 5.47, $M_{pathogen}$ = 5.73, F(417) = 2.544, p < .09). Given that subjects in the sexual T-shirt condition were most avoidant of this romantic behaviour, the effect is in the predicted direction. To see if this difference was significant from participants in the moral and the pathogen conditions, planned contrasts were performed (see Table 13). Avoidance was significantly higher in the sexual condition than the moral condition (t = 2.23, p < .03), but not the pathogen condition (t = .818, p < .42). These findings partially support H3a, but fail to support H1a and H2a.

Table 12: Means (Standard Deviations) and F-scores for Avoidant Behaviour Across T-shirt Types.

	Tshirt Disgust Type				
	Sexual	*Moral*	*Pathogen*	F	*p*
Avoidance Type					
Lending Password	5.85 (1.53)	5.83 (1.44)	5.61 (1.72)	1.032	.357
Lending Money	4.07 (2.17)	4.15 (2.23)	3.86 (2.27)	.654	.521
Share a Straw	6.08 (1.38)	5.92 (1.49)	5.90 (1.62)	.592	.554
Stand Close to	3.35 (2.03)	3.17 (1.70)	3.28 (2.30)	.259	.772
Desire a date	$5.88\ (1.53)_M$	$5.47\ (1.36)_S$	5.73 (1.68)	2.544	.080*
Desire as partner	3.44 (2.26)	3.13 (1.73)	3.06 (2.16)	1.327	.266

Table 13: Means, Standard Deviations and Scale Reliabilities for Domain-Specific Disgust Sensitivity in Study 2.

Sensitivity Domain	M	SD	α
Sexual	4.430	1.604	.88
Moral	5.657	1.274	.92
Pathogen	5.370	1.117	.83

Table 14: Means, Standard Deviations for Attributions

Attribution Domain	M	SD	α
Sexual	4.867	1.337	.69
Moral	4.645	1.255	.71
Pathogen	4.301	1.159	.57

Table 15: Planned Contrasts for Avoidance of Date

Disgust Condition Comparison	*t*	df	*p*
Sexual - Pathogen	.818	417	.414
Sexual - Moral	2.230	417	.026**
Pathogen - Moral	-1.417	417	.157

Prior to testing our mediation hypotheses (H1b, H2b, and H3b) we present the results of H4. Recall that H4 posits that the effect of t-shirt type on domain-specific attributions will be moderated by individual differences in domain-specific disgust sensitivity. In other words, the negative hygienic attributions assigned to an individual wearing a pathogenically disgusting t-shirt will be higher for respondents with a strong sensitivity to pathogen disgust. Likewise, negative morality/attractiveness attributions towards individuals wearing morally/sexually disgusting t-shirts will be highest for participants with a strong sensitivity to moral/sexual disgust, respectively. Recall that moderation analyses require the creation of an interaction term

(the independent variable multiplied by the moderating variable). If the interaction term significantly predicts the dependent variable, the moderation hypothesis is confirmed. We test for moderation first so that the interaction term (if significant) can be used as the independent variable in the mediation model.

Moderation

As in study 1, the moderation analysis will test each disgust type against the other two. To do this, three binary independent variables were added to the data. Essentially, each t-shirt was given a pathogen, moral, and sexual variable. So, all pathogenically disgusting t-shirts were coded 1, 0, 0, respectively. Moral shirts were coded 0, 1, 0 and sexual t-shirts were coded 0, 0, 1. This allowed us to compare the effect of one type versus the other two at once.

H4a predicts that pathogenically disgusting t-shirts will elicit more negative hygiene attributions as sensitivity to pathogen disgust increases. To test for this, the binary variable pathogen t-shirt, pathogen disgust sensitivity, and the interaction term (pathogen t-shirt * pathogen disgust sensitivity) were entered as predictors into a linear regression with negative hygiene attributions as the dependent variable. In support of H4a, the interaction term (pathogenic t-shirt * pathogenic disgust sensitivity) was a significant predictor of pathogenic attributions ($t = 3.21$, $p < .001$).

H4b predicts that sexually disgusting t-shirts will elicit more negative sexual attributions from respondents who are particularly sensitive to sexual disgust. To test for this, the binary variable sexual t-shirt, sexual disgust sensitivity, and the interaction term (sexual t-shirt * sexual disgust sensitivity) were entered as predictors into a linear regression with negative

attractiveness attributions as the dependent variable. The interaction term was not significant (t = 1.126, p < .26), and failed to support H4b.

H4c predicts that morally disgusting t-shirts will elicit more negative moral character attributions from respondents who are particularly sensitive to moral disgust. To test for this, the binary variable moral t-shirt, moral disgust sensitivity, and the interaction term (moral t-shirt * moral disgust sensitivity) were entered as predictors into a linear regression with negative moral character attributions as the dependent variable. The interaction term was not significant (t = .133, p < .89), and failed to support H4c.

Mediation

H1b, H2b, and H3b propose that the influence of t-shirt type on avoidant behaviour should be mediated by domain-specific attributions. A mediating variable is a variable "in between" the independent and the dependent variable. In other words, the independent variable influences the dependent variable by influencing the mediator. For example, let's consider the relationship between climate and sales of lemonade. When it is hot outside, lemonade sellers sell more lemonade. So, careful observers will note that the relationship between temperature and lemonade sales is positive. However, no reasonable person can suggest that this relationship is direct (the heat itself is not 'why' the lemonade gets sold). In this case, one might consider adding thirst as a mediator. Thence, heat makes people thirsty, and thirst makes people buy lemonade.

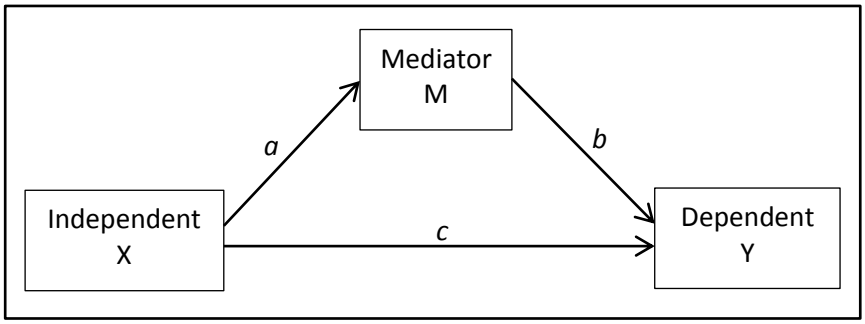
In our lemonade example, we had a main effect (heat on lemonade sales) that was mediated (by thirst). While the majority of our main effects and moderating relationships did not emerge, the absence of a main effect does not necessarily mean that a mediating

relationship cannot be observed (contrary to the Baron and Kenny (1986) mediation approach). Zhao, Lynch and Chen (2010), demonstrate that mediating relationships can exist in the absence of main effects. Essentially, Baron and Kenny's (1986) paper details a four-step process for testing mediation. The first of these steps is to test for the main effect of an independent variable on the dependent variable. To summarize Zhao et al. (2010) in one breath; they demonstrate that this step is not necessary. It is perfectly reasonable to have a mediation model wherein the direct path (path c, see Figure 2) is not significant. This can occur when path a and path b have opposite signs (one is a positive relationship while the other is negative). For example, let's take an example from Zhao et el. (2010). We're going to study the relationship between condom availability (X) and sexually transmitted disease prevalence (Y). The obvious guess is that the relationship between condom availability and sexually transmitted disease should be negative. However, condom availability also decreases the perceived risk of casual sex (our mediator, M). This has a *positive* effect on sexually transmitted disease prevalence. If the influence of reduced perception of risk is strong enough, then the typically negative relationship between condom availability and sexually transmitted infections could (theoretically) be supressed to the point of non-significance.

Zhao et al. also provide a mediation script (which has been empirically validated in Preacher and Hayes (2004). Essentially, the script can be run in SPSS and merely cuts out the need for the researcher to test each path individually. As with all mediation tests, the significance of simple paths a, b, and c (See Figure 2), and an indirect (mediating) path (a-b) are estimated. Mediation is confirmed if the latter path is significant (indicated by a significant Sobel z-score). Path a tests the relationship between the independent variable (X) and the mediator (M). Path b tests the relationship between M and the dependent variable (Y). The direct, c path tests the main effect of X on Y. Rather than running an analysis for each path individually, the

script provided in Zhao et al. (2010) tests these paths all at once, which simply cuts out some leg work in the analysis.

Figure 2: Conceptual Model for Mediated Relationships



To test H1b, we ran two mediation analyses. The first test investigated whether or not people are more reluctant to share a straw with someone wearing a pathogenically (versus sexually or morally) disgusting t-shirt, and if this relationship is driven by negative hygiene attributions. The second test investigates the same independent and mediating variables, for their influence on reluctance to stand close to someone. Because our moderation analysis confirmed that pathogen disgust sensitivity moderates the relationship between pathogenically disgusting t-shirts and negative hygiene attributions, we used the interaction term (pathogenically disgusting t-shirt * pathogen disgust sensitivity) as the independent variable. For sharing a straw, path *a* was significant ($t = 7.33$, $p < .001$), path *b* was significant ($t = 4.45$, $p < .001$), and the full indirect path (*ab)* was also significant (Sobel's $Z = 3.81$, $p < .03$). The main effect was not significant ($t = -1.02$, $p < .31$). This leads us to conclude that a) the hypothesized mediation is present, and b) that the effect of t-shirt type on the dependent variable only operates indirectly. The second test of H1b was less successful. Neither path *c* or path *b* was

significant. The full indirect path (*ab*) was also not significant (see Figure 4). Thus, the evidence for H1b is mixed.

Figure 3: Pathogen Disgust Mediation Analysis 1

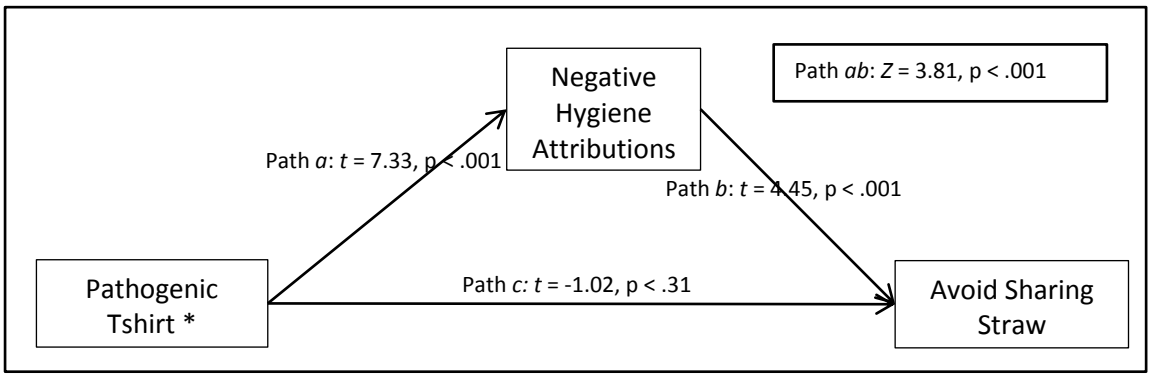
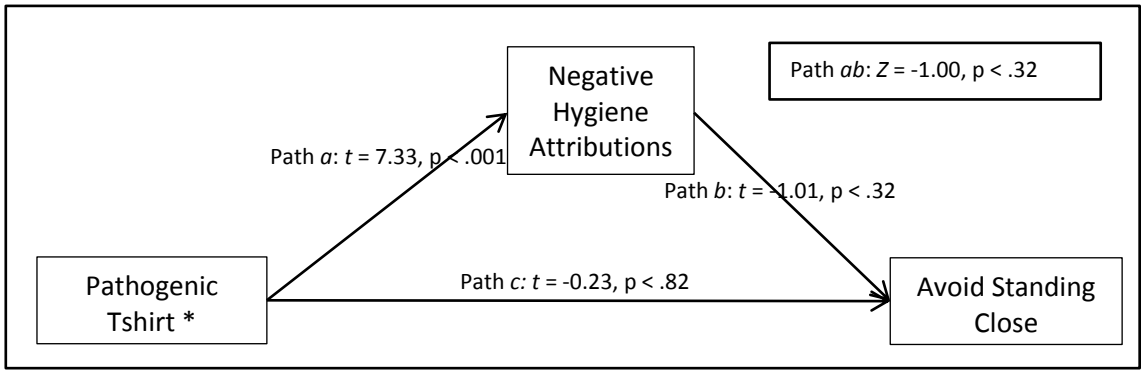


Figure 4: Pathogen Disgust Mediation Analysis 2



To test H2b, we ran two mediation analyses. The first test investigated whether or not people are more reluctant to go on a date with someone wearing a sexually (versus pathogenically or morally) disgusting t-shirt, and if this relationship is driven by negative attractiveness attributions. The second test investigates the same independent and mediating variables for their influence on reluctance to consider someone a good romantic partner. Path *a* was significant (t = 3.72, p <.001), path *b* was significant (t= 17.49, p < .001), and the full indirect

path was also significant (z = 3.65, p < .001, see Figure 5). The second mediation test was not significant (see Figure 6). Thus, we find split evidence to support H2b.

Figure 5: Sexual Disgust Mediation Analysis 1

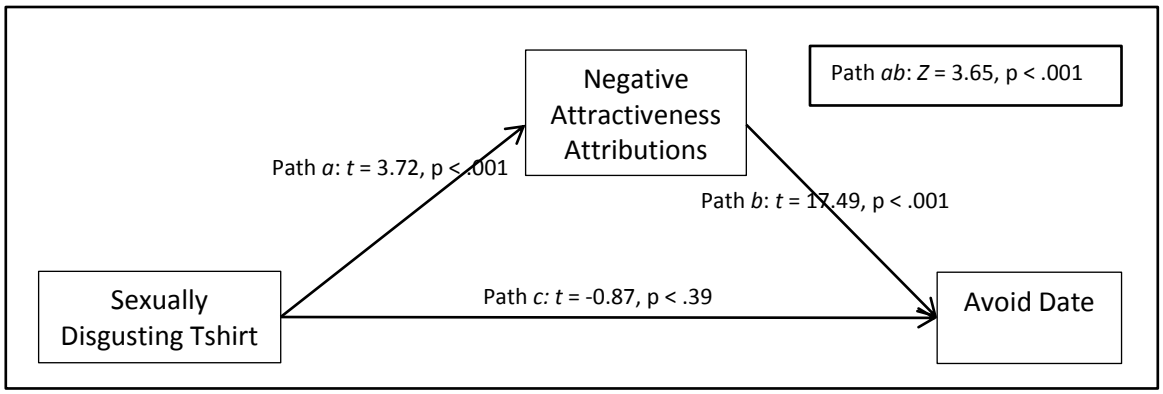
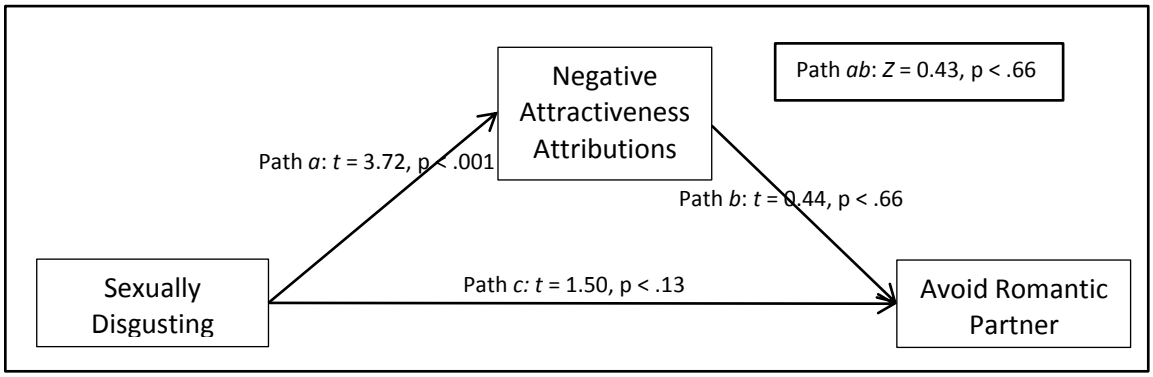


Figure 6: Sexual Disgust Mediation Analysis 2



To test H3b, we again ran two mediation analyses. The first test investigated whether or not people are more reluctant to share an important password with someone wearing a morally (versus pathogenically or sexually) disgusting t-shirt, and if this relationship is driven by negative morality attributions. However, morally disgusting t-shirts were not related to attributions of negative moral characteristics (path *a*: *t* = -.25, P < .81). We can conclude at this point that there is no indirect relationship from morally disgusting t-shirts to either lending money or sharing

passwords through attributions of negative moral character. This is because path a is the same regardless of the dependent variable, and must be significant for the indirect path (*ab*) to be significant. Thus, we find no support for H3b.

DISCUSSION

Study 2 confirmed some of our predictions. For both the pathogen and the sexual t-shirts, we found that effects on domain-specific avoidant behaviour were mediated by domain-specific negative attributions about the wearer. However, four of our six dependent measures did not yield significant effects, even when individual differences in domain-specific disgust sensitivity are included as a moderator. These null effects deserve explanation. One possibility is that some of the behavioural items were simply too vague. Another possibility is that they were either too strong or too weak to produce meaningful variance. Yet another possibility is that the t-shirts did not activate disgust as intended. We discuss weak and ambiguous dependent measures as potential explanations for our null effects first. Subsequently, we address how weak manipulations of moral disgust might be responsible for the lack of effects in that domain.

The pathogen-avoidant behavioural item "not want to stand close to them on a crowded bus" is slightly less specific than the item "feel comfortable drinking from the same straw they had just drank from." In the former, the term 'close' implies a non-specific amount of distance, which could or could not imply physical contact. Conversely, drinking from the same straw quite clearly implies that one's mouth will make contact with something that has been in the mouth of a disgusting person. Like our pathogen-avoidant items, one of our romance-avoidance items was problematically vague as well. It read: "think that they would not make a good romantic partner." First, the item itself does not express a clear action that the consumer

can take. Second, the concept “good romantic partner” is also quite ambiguous. For some individuals, romantic may imply something passionate and short-term, whereas others may infer emotional commitment and relationship longevity. An individual wearing a t-shirt with a promiscuous slogan or logo may actually be more preferred by those with the former interpretation, and less by those with the latter. With both this item and that from the pathogen domain, specificity of action was lacking. Without sufficient specificity of action in the dependent measures, response noise may simply be too high to yield significant findings. Examining the variance in responses confirmed this suspicion. Both the “good romantic partner” and “stand close” items had considerably more response variance (4.27 and 4. 09, respectively) than the more specific items they were paired with (2.24 and 2.36).

A slightly different consideration from item ambiguity is item strength. Our dependent measures may have been too weak or too strong, rather than too vague. By too weak, we mean that it would not be a terribly costly behaviour to perform, even when the disgust cue is present. For example, standing close to someone who is pathogenically disgusting is not nearly as costly as sharing the same straw with them. Conversely, items that are too strong will also not produce variance across conditions. By too strong we mean that performing the behaviour is expensive, regardless of the presence of disgust cues. Our item “trust them with an important password” may fall into this category, as many people keep their passwords private even from their most trusted friends and colleagues.

Another issue with the behavioural measures is that the negatively phrased items may not have been obvious to respondents. Recall that the behavioural items exhibited very low inter-item reliabilities. The majority of respondents entered the same value for both the positively and negatively worded behavioural items within a given domain. This seems to

suggest that a non-trivial amount of participants simply misread the negatively phrased items. Consulting with the data basically confirms this. Approximately half of the time, participants' response to the negatively-phrased item was within two points of the positively framed one (this happened 175 times for the pathogen items, 245 for the moral items, and 205 times for the sexual items). A rather high proportion of participants showed no difference between the positively and negatively worded items (91 times for the pathogen items, 156 for the moral items, and 127 times for the sexual items). This seems to suggest that participants were not sufficiently cognitively engaged in the task.

GENERAL DISCUSSION

Limitations

Across two studies, we found minimal support for the posited hypotheses. While it is conceivable that this may have been due to poor if not incorrect theorizing, we feel that it is most likely due to poor operationalization of our constructs and poor execution. Most of the operationalization issues have been discussed in the previous two discussion sections. In study 1, we did not a) utilize dependent measures that were directly relevant to the disgust manipulations, b) anticipate the effect of moral licensing or c) minimize cross-activation. In study 2, we attempted to correct for these issues by a) having subjects judge a contaminated individual, b) omit stimuli which allowed subjects to feel morally superior, and c) included multiple t-shirts to get composite ratings within each domain (thus minimizing cross-activation). That said, study 2 suffered from its own limitations. Shortcomings in our operationalization may account for the mixed findings of H1 and H2, and lack of findings for H3. Chief among these were that some of the dependent measures may have been too vague or too weak.

In order to move forward with this research topic, careful attention must be paid to the operationalization of variables. The most difficult dilemma in operationalizing a domain-specific manipulation of disgust is that the disgust triggers tend to cross-activate. In other words, one is only slightly less likely to share his/her straw with a dirty, stinky stranger than they are to lend them a dollar or ask them on a date. We tend to avoid interacting with disgusting people in any way we can. While individual sensitivities to feelings of disgust may vary in three independent domains, our options for avoiding the offending entities are largely the same: We just walk away. Future researchers should be mindful of domain-general solutions to domain-specific problems when attempting to isolate them for study.

In addition to this problem are the challenges of item vagueness and strength . Some behaviours were so banal that participants may not perceive the behaviour as more costly when performed with a disgusting person than with a non-disgusting person (e.g.., standing close to them on a bus). Future studies could address these issues by utilizing only very strong, specific items and forcing choices and/or measuring actual behaviour. Rather than having respondents indicate how willing they are to engage in the various activities on a 1-7 scale, tell them that they must choose four out of the six behaviours to perform with the disgusting person. By forcing participants to choose, we could amplify the small differences between the 6 behaviours. This could bring the domain-specific behavioural avoidance measures into greater contrast, and thus reduce the noise that cross-activation introduces.

While our studies did not convincingly demonstrate that each of three domains of disgust influence consumers in unique and predictable ways, we do not conclude that this was due to poor theory. Instead, we suggest that limitations in the design of our studies are the likely culprits. In the future, it would behoove researchers interested in testing the three-

domain model of disgust to a) avoid self-report measures and b) carefully isolate each domain from the others through rigorous pretesting.

Implications

Had the above limitations been addressed, we may have found evidence to support our hypotheses. Had we found support for our hypotheses, our findings would have yielded some practical insights for marketers. One area in which a domain-specific understanding of disgust is relevant to managers is the management of crises. For each of the following examples, our findings could have aided in the management of the crisis by speaking to the domain-specific methods for extinguishing domain-specific disgust.

Brand crises are a relatively common occurrence, even for major brands. In 2010, Toyota, British Petroleum, Facebook, and Apple all faced brand crises of varying type and severity. Whether a brand's crisis is minor or disastrous, it generally has a negative impact on consumer attitudes. One of the mechanisms by which this attitude reduction occurs is disgust. For instance, when consumers hear that McDonald's employees are spitting in the milkshakes, they become disgusted. A domain-specific approach to disgust would further posit that they become pathogenically disgusted. This approach would focus crisis management efforts on the pathogen-centric concerns of the consumers first and foremost. In other words, McDonald's should pledge to raise health safety standards rather than communicate the punitive measures to be exacted on the misbehaving employees.

Even in less obviously disgusting scenarios, the other domains of disgust may be operative. Take for example the Gulf Coast oil spill of 2010. British Petroleum was found to be

responsible for the largest ecological disaster in the history of the petroleum industry. The brand was evasive and deceptive about the causes of the crisis, and consumers had a strong, negative reaction to not only the crisis itself, but British Petroleum's management of it. A major component of this crisis management failure was the underestimation of the power of moral disgust. Moral disgust is triggered by those who take benefits without paying the requisite costs. Oil companies that do not sufficiently bolster their safety protocols certainly qualify as morally disgusting.

In moral offenses such as the British Petroleum spill, addressing the moral disgust of consumers should take chief priority. In a moral offense (and contrary to our McDonald's example), consumers may desire moral retribution over corrective action. Thus, a firm condemned as a moral violator might have an easier time preserving its image by emphasizing the firing of the responsible parties rather than emphasizing a promise to clean up their mess and never make the same mistake again.

Finally, at the nexus of brand crises and sexual disgust, we can examine dating services. A concern among those who do not join dating websites is that they do not trust the information contained on members' profiles. It is, after all, much easier to lie over the internet than in face-to-face interactions. Sexual disgust could be aroused in the event that one member discovers that another has been deceptive with their profile information.

To delimit the influence of sexual disgust in online dating, dating services could address this concern in a few ways. First off, they could encourage honesty at the profile creation stage of the service. To this end, they may tell users that members of the opposite sex find honesty attractive (even if it isn't always true). They could more directly increase honesty through the development of carefully worded personality questionnaires. If the questionnaire can be

developed in a way that minimizes demand characteristics, and then used to match individuals, it should reduce perceived deception and thus, the incidence of sexual disgust among users.

It is also possible that even if we had corrected for all of the aforementioned limitations, we would still have weak results. In this case, we could suggest that while disgust appears to break into three subdomains at the individual differences level (as demonstrated in Tybur et al., 2009), they may not activate independently. In other words, activation through one domain will tend produce avoidance in all three. This would have a different set of implications for managers than those previously discussed.

If cross-activation is robust and reliable (meaning it happens for all three subdomains, and arouses equally strong levels of disgust for all three subdomains), then managers have much to be afraid of. Disgust might be negatively influencing their business in unexpected ways. For instance, if moral or pathogen disgust cross-activates pathogen disgust, then a restaurant's food evaluations could be influenced by moral or sexual factors. Take for example the ethical treatment of employees. If the restaurant treats their employees unfairly, and customers find out about it, they may become morally disgusted. If moral disgust simultaneously engages pathogen disgust, then these morally disgusted consumers will not only have reduced evaluations of the moral character of the management, but also of the food they are served. We could call this effect the "backdoor disgust" effect.

Sexual disgust could also create this "backdoor disgust" effect. Imagine that a male waiter was interested in a female client, so he attempts to flirt with her. If she is totally uninterested, his pursuit could engage sexual disgust. If sexual disgust cross-activates pathogen disgust, then this client would not only have a reduced evaluation of the service, but also of the meal itself.

In terms of crisis management, firms that have disgusted their clientele may need to address more than just the primary domain of disgust, but other domains as well. However, certain scenarios preclude the need to address all three domains. For example, it is difficult to imagine how consumers would respond to British Petroleum's attempt to assuage their sexual disgust. In other domains (such as consumer deception in online dating) all three domains would probably need to be addressed. Deception about one's mate value is clearly a sexual threat, but deception more generally is also considered immoral. Furthermore, lies in the sexual domain could leave one reasonably concerned about which sexually transmitted pathogens the liar might have (and if they would be honest about them).

However, these implications must be taken with a grain of salt. Given the clear methodological limitations in our study, it is difficult to conclude that our null findings are "true" null findings. If there were an established protocol for activating domain-specific disgust, and if our findings had failed to replicate the established protocol in controlled settings, then we could call the underlying theory into question. However, the work here is a first attempt at domain-specific activation of disgust. As such, we cannot reach firm conclusions as to why our operationalization failed.

Future Research

Pathogen

Evolutionary theories have yielded a plethora of interesting findings related to pathogens. Pathogens constitute one of the most omnipresent threats for the majority of life

forms, so it is only natural that we have evolved clever ways of avoiding them. One of the cleverest ways is to change our social and political values in response to the concentration of pathogens in the environment. Conservative politics is characterized by a preference for ethnically similar others. For example, a politically conservative employer is much more likely than a politically liberal employer to hire a candidate who is ethnically similar (versus dissimilar) to himself. On the outside, this appears to be racism, but Thornhill, Fincher, and Aran (2009) have explored the idea that this may be an adaptation for avoiding pathogens. Thornhill's group has found that a country's political conservatism is correlated to the ambient pathogen load. The more bugs in the environment, the more politically conservative it's population. This is because people who are genetically similar (i.e. the same ethnicity) are also immunologically similar. However, those who are genetically dissimilar (i.e. different ethnicities) also have different sets of immunities. Because of this, they may be unwitting carriers of devastating illnesses. However, the exact mechanisms by which this is achieved have not yet been fully studied. A question relevant to political marketing is if the effect of pathogen presence on political leanings operates consciously or not. If it operates through conscious processes (like perception of pathogen load), then it could potentially be manipulated. Liberal candidates might gain favour by emphasizing health and wellness, and conservative candidates would gain favour by emphasizing the presence of disease.

Moral

Norms play a vital role in determining what is morally acceptable in a given society. However, an evolutionary account of norm-violations adds a compelling twist to the story.

Cummins (1998) found that individuals are less likely to notice a norm violation when it's committed by a person of higher relative social status. However, if the norm violation is committed by a subordinate, it is more likely to be detected. Cummins argues that this is an adaptation to group living. In traditional societies (i.e., the sort wherein we evolved) social status is not given out freely. Thus, individuals that have it usually have it through implied group consensus. In other words, they bring the group benefits, usually because of their ability to lead, so the group lets them get away with things. If that individual were to be fully reprimanded for violating a norm, the subsequent loss in group cohesion might outweigh the cost of their original transgression. Therefore, it is in an individual's own interest to forgive and forget when the chief breaks the law. However, those in lower social status bring no such benefits to the group, and as such have no leverage when they are caught violating a norm. A possible venue for inquiry is to look at the effect of social status on moral disgust sensitivity. It could be that those with high status can afford to have very high moral disgust sensitivities, whereas those below them might be better off with less moral disgust sensitivity.

Sexual

As discussed previously, sex differences in sexual disgust sensitivity are both large and robust. For clear adaptive reasons, men are much less sensitive to sexual disgust, whereas women are much more sensitive. Biologically speaking, the cost of promiscuity for men is low, and the benefits are high. Men who are particularly promiscuous and virile can produce multiple offspring at the same time. For women, promiscuity can quickly lead to a costly pregnancy and single parenthood. However, these cost/benefit ratios can be influenced by a number of

contextual factors. For instance, women who are postmenopausal (and thus, infertile), are no longer burdened by the threat of unwanted pregnancy. This leads one to wonder if postmenopausal women experience a reduction in the sexual disgust sensitivity, and a broadening of their sexual horizons. If so, marketers of sexual products may find an unexpected market in infertile women.

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APPENDICES

Study 1

Questionnaire Introduction

We'd like you to read the following story and then answer some questions about feelings. At the end of the survey, you will be asked questions about this story, so it's important to read it very closely. Please read the story closely and envision everything as if it were happening to you in real life.

Sexual prime

Imagine you're on a fourth date with someone. You have not had sex, but they seem to have long-term potential. While walking in the park, they tell you that they enjoy frequent one night stands, sex with multiple partners at the same time, and having sex in public places. At the end of the date, they suggest that you come over to watch a pornographic video. They suggest that it might be fun to invite their roommate to watch it with you.

Moral prime

Imagine you're in a waiting room. Sitting next to you is a person on their cellphone. You overhear them bragging to their friend about how they always cheat on exams and cut to the front of the line at movie theatres. They say that to get ahead, sometimes you have to step on people. Then, they say that they'll have to steal some cash from their roommate in order to go drinking this weekend. "It's no problem. I know exactly where she keeps her stash."

Pathogen prime

Imagine you're taking the subway in a crowded city. You get on and are forced to stand next to a person with extremely strong body odor. The metro stops suddenly and you brush arms with them. You look at their arms and notice they are covered in red, open sores that they keep scratching. In order to avoid bumping them again, you grab the metal pole to stabilize yourself. The pole is warm, and has something wet and sticky right where you grabbed it.

Dependent measures

Now, we'd like you to evaluate some possible behaviors. For this next study, please rate the behaviors according to **how you feel about** them.

How do you feel about...

...using dating services (speed dating, online dating, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

...going to the hospital to diagnose a severe fever (urgent care, emergency room, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

...purchasing sexual products (lubricant, hand-cuffs, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

...using contraceptive methods (condoms, the pill, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

…donating to charities (UNICEF, Red Cross, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

…purchasing illegal counterfeit fashion items (watches, sunglasses, bags, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

…downloading pirated material (movies, music, software, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

…purchasing used or second-hand clothing (from a garage sale, a thrift store, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

…eating at an all-you-can-eat buffet (salad bar, chinese, etc.)?

Dislike	○	○	○	○	○	○	○	Like
Undesirable	○	○	○	○	○	○	○	Desirable
Negative	○	○	○	○	○	○	○	Positive

Disgust Sensitivity (studies 1 and 2)

The following items describe a variety of concepts. Please rate how ***disgusting*** you find the concepts described in the items, where 0 means that you do not find the concept disgusting at all and 6 means that you find the concept extremely disgusting.

	Not at all disgusting: 0	1	2	Moderately Disgusting: 3	4	5	Extremely Disgusting: 6
Shoplifting a candy bar from a convenience store	○	○	○	○	○	○	○
Hearing two strangers having sex	○	○	○	○	○	○	○
Stepping on dog poop	○	○	○	○	○	○	○
Stealing from a neighbour	○	○	○	○	○	○	○
Performing oral sex	○	○	○	○	○	○	○
Sitting next to someone who has red sores on their arm	○	○	○	○	○	○	○
A student cheating to get good grades	○	○	○	○	○	○	○
Watching a pornographic video	○	○	○	○	○	○	○

	Not at all disgusting: 0	1	2	Moderately Disgusting: 3	4	5	Extremely Disgusting: 6
Please select "Not at all disgusting"	○	○	○	○	○	○	○
Shaking hands with a stranger who has sweaty palms	○	○	○	○	○	○	○
Deceiving a friend	○	○	○	○	○	○	○
Finding out that someone you don't like has sexual fantasies about you	○	○	○	○	○	○	○
Seeing some mold on old leftovers in your refrigerator	○	○	○	○	○	○	○
Forging someone's signature on a legal document	○	○	○	○	○	○	○
Bringing someone you just met back to your room to have sex	○	○	○	○	○	○	○
Standing close to a person who has body odor	○	○	○	○	○	○	○
Cutting to the front of a line to purchase the last few tickets to a show	◉	○	○	○	○	○	○
A stranger of the opposite sex intentionally rubbing your thigh in an elevator	○	○	○	○	○	○	○
Seeing a cockroach run across the floor	○	○	○	○	○	○	○

	Not at all disgusting: 0	1	2	Moderately Disgusting: 3	4	5	Extremely Disgusting: 6
Intentionally lying during a business transaction							
Having anal sex with someone of the opposite sex							
Accidentally touching a person's bloody cut							

Manipulation Check

Please try to remember the story you read. How did that story make you feel?

	Not at all			Moderately			Extremely
Sexually repelled							
Romantically repulsed							
Ethically revolted							
Morally offended							
Hygienically sickened							
Grossed-out by germs							

STUDY 2

Sexual T-shirts:

Pathogen T-shirts:

Moral T-shirts:

Dependent Measures

If I saw someone wearing this shirt, I would:

	Definitely would not			Maybe			Definitely would
Trust them with an important password	○	○	○	○	○	○	○
Avoid lending them money	○	○	○	○	○	○	○
Feel comfortable drinking from the same straw they had just drank from	○	○	○	○	○	○	○
Not want to stand close to them on a crowded bus	○	○	○	○	○	○	○
Consider going on a date with them	○	○	○	○	○	○	○
Think that they would not make a good romantic partner	○	○	○	○	○	○	○

If I saw someone wearing this shirt, I would think they were:

	Not at all			Moderately			Extremely
Trustworthy	○	○	○	○	○	○	○
Corrupt	○	○	○	○	○	○	○
Dependable	○	○	○	○	○	○	○
Irresponsible	○	○	○	○	○	○	○
Dirty	○	○	○	○	○	○	○
Hygienic	○	○	○	○	○	○	○

	Not at all			Moderately			Extremely
In good physical shape	○	○	○	○	○	○	○
Contagious	○	○	○	○	○	○	○
Sexy	○	○	○	○	○	○	○
Perverted	○	○	○	○	○	○	○
Attractive	○	○	○	○	○	○	○
A turn-off	○	○	○	○	○	○	○