



## Stigma mitigation and the importance of redundant treatments



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### ABSTRACT

Disgust can evoke strong behavioral responses. Sometimes these extreme visceral responses can lead to stigmatization—an overreaction to a risk. In fact, disgust may be so inhibiting that it leads people to refuse to consume completely safe items, such as treated drinking water, leading to important economic and policy implications. Using economic experiments, we provide a measure of the behavioral response to disgust. Our findings suggest that when monetary incentives are provided, the behavioral response may have been exaggerated by previous studies that have relied on survey methods. Furthermore, mitigation steps successfully reduce the stigma behavior. In fact, the results suggest that stigma is primarily reduced not by a specific mitigation step taken but by how many steps are taken consecutively. These results have important implications for policies addressing issues such as the global shortage of drinking water. Some efforts to resolve the shortage have involved recycled water that is completely safe to drink but is often rejected because of reactions of disgust.

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## 1. Introduction

In economics, an increase in risk associated with a task or lottery typically requires an increase in expected payoff if the participant is to remain indifferent between choices (Fama & Macbeth, 1973; Friedman & Savage, 1952; Savage, 1951; Sharpe, 1964; Von Neumann & Morgenstern, 1947). How large the increase in expected payoff must be depends on the individuals' risk preferences and the magnitude of the risk (Harrison, Lau, & Rutström, 2007; Holt & Laury, 2002; Tversky & Wakker, 1995). For example, if individuals in an experiment are asked to indicate their willingness to pay (WTP) to avoid drinking a glass of spring water versus a glass of water that has come into contact with a contaminant, one expects the WTP for the contaminated water to be higher because of the potential health risks. How much more an individual would pay should depend on the risk attitudes of the individual and the probability of that person falling ill or even dying. Normative economics suggests that individuals have proportionate responses to increases in participatory risk.

But what if drinking the “contaminated” water does not increase the participatory risk? Say the contaminant is removed and the water treated, so the contaminated water is as clean as the spring water. In that case, its consumption should not increase the individual's WTP relative to spring water. But that may not be the case. Research of psychological stigma has found that individuals can stigmatize perfectly safe items simply because they have previously come into contact with a

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contaminant. The reason for rejecting a perfectly safe item can be attributed to the notion of “once in contact, always in contact”, also referred to as the law of contagion.

The concept of the law of contagion dates back to the principles of sympathetic magic (see Frazer, 1959; Mauss, 1972). Although, originally describing primitive and ritualistic belief systems, Rozin, Millman, and Nemeroff (1986) argue that the laws are also present in today’s modern Western culture. The principles of sympathetic magic include two laws. (1) The law of contagion, wherein a formerly clean item is stigmatized through contact with a contaminated object, rendering the item itself contaminated. The item remains contaminated even if the item physically is separated from the contaminated object. In this sense, the essence of the contagion remains with the item even when no physical trace is left. One of many real-world examples is recycled drinking water that is, from a scientific perspective, as clean as or even cleaner than other types of drinking water, but is shunned due to its sewage origin. (2) The law of similarity, wherein two objects that resemble one another also share certain properties. For example, chocolate shaped dog feces may drastically reduce an individual’s desire to consume the chocolate (Rozin et al., 1986). In this manuscript, our analysis will focus on the stigma related to the first law of sympathetic magic—the law of contagion—and the behavioral responses associated with disgust related to contagion.

Contagion, can stigmatize goods even if the contagion does not increase the participatory risk – the contagion may not pose a health risk but, instead, morally offend and disgust individuals, such as a sterile, dead insect dipped into a glass of drinking water. According to Walker (2001) stigma is, “. . . an unwarranted level of avoidance behavior . . . an overreaction to something”. Moreover, although individuals may understand the associated risk from an objective and scientific perspective and may not be fearful, they may still become stigmatized. Their subjective reasoning and the visceral reaction to contaminated items, can be explained by disgust (Fallon, Rozin, & Pliner, 1984; Flynn, Slovic, & Kunreuther, 2001; Goffman, 1963; Haidt, McCauley, & Rozin, 1994; Hejmadi, Rozin, & Siegal, 2004; Nemeroff & Rozin, 1994; Rozin, 2001; Rozin, Fallon, & Augustoni-Ziskind, 1985; Rozin, Haidt, & McCauley, 2000; Rozin, Nemeroff, Horowitz, Gordon, & Voet, 1995; Rozin et al., 1986). Disgust shares fundamental characteristics with the laws of sympathetic magic and is relatively easy to produce in laboratory settings (Rozin et al., 1986). Moreover, unlike stigma related to bodily harm, such as many technological stigma (see Rozin, 2001) disgust offers researchers a safe way to study stigma and stigma mitigation in non-hypothetical experiments. Clearly revealed preference studies, such as exposing participants to bodily harm, are likely unethical and difficult to implement. Thus, making disgust an ideal candidate to study as it invokes a similarly strong stigma response (Rozin, 2001).

Oral ingestion ranks among most contaminant-sensitive body spots (Rozin et al., 1995). Additionally, social and cultural norms have a strong influence over disgust (Gerard & Rabbie, 1961; Goffman, 1963; Kahan, 1998; Meigs, 1978). In western societies, feces, most body parts and secretions, and insects (especially in North American cultures) are generally considered as disgusting (Rozin et al., 1985). Given the similarities between stigma related to dangerous items and stigma related to disgusting items, we explore behavioral responses in revealed preference experiments related to harmless exposure to a disgusting task. We define disgust, following Rozin et al. (1986), as “a revulsion at the prospect of (oral) incorporation of an offensive substance” (see also Angyal (1941)).

An interesting example is drinking water contaminated by a cockroach. In a study in which dead sterilized cockroaches were dipped into glasses of spring water, Rozin et al. (1986) showed principal refusal of participants to drink the water even though there was no increased risk associated with it. These results are important because of their implications for policy and their potentially large monetary effects. However, these conclusions relied on stated preference surveys and, given the hypothetical nature of that research, may not reveal true preferences regarding disgust and the cost to overcome it. Rozin et al. (1986) first showed that disgust could be created in the lab by dipping a dead sterilized cockroach into drinking water and recording participants’ reactions to the water, offering a unique way to study stigmatization in a risk-free setting. In the same study, the authors showed that experiment participants strongly preferred not to eat pieces of fudge shaped like dog feces or vomit (law of similarity). Moreover, in Rozin (2001) the authors show that orange juice that had been in contact with a dead sterilized cockroach and then frozen for a year still resulted in participants completely rejecting consumption of the juice indicating the time insensitivity of disgust. These experiments were creative and the results interesting; however, given the hypothetical nature of the choices made in the experiments, the results may not be representative of situations in which individuals make incentive-compatible choices—choices in which they receive payment and must actually perform the task. Hence, Rozin et al.’s (1986) findings deserve further exploration.

There exist little research looking at stigma from an economic perspective (Akerlof, Yellen, & Katz, 1996; Furuya, 2002; Hoffmann, Fooks, & Messer, 2014; Kanter, Messer, & Kaiser, 2009; Moffitt, 1983; O’Flaherty & Sethi, 2008; Schulze & Wansink, 2012; Vishwanath, 1989; Wu, Fooks, Messer, & Delaney, 2015). Messer, Schulze, Hackett, Cameron, and McClelland (2006), for example showed that stigma maybe time sensitive – in research involving communities that neighbor large superfund sites, when contamination was not removed relatively soon after it occurred, the value of homes surrounding the sites declined even after the point where no human health risks from the contamination remained. Kerley-Keisner, Messer, Schulze, and Zarghamee (2013) found that when disgust impacts commodities and public goods, group decision-making can foster socially preferred outcomes by alleviating the stigma response. None of the previous literature has adequately addressed the impacts of economic decision-making considering stigmatization through disgust and ways to mitigate these potentially strong reactions.

Motivated to gain this knowledge and fill the gap in the literature, we conducted experiments with 94 participants in which drinking water was “contaminated” by contact with a dead, sterilized cockroach as in previous studies designed to invoke a stigma response in participants (Rozin et al., 1986). The difference is that our experiments provide monetary

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