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Testing the Model of Stigma Communication with a Factorial Experiment in an Interpersonal Context

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Abstract

Stigmas may regulate intergroup relationships; they may also influence interpersonal actions. This study extends the previous test of the model of stigma communication (Smith, 2012) with a factorial experiment in which the outcomes refer to a hypothetical acquaintance. New affective reactions, sympathy and frustration, and a new personality trait, disgust sensitivity, were explored. In addition, perceived severity and susceptibility of the infection were included as alternative mechanisms explaining the effects. The results ($n = 318$) showed that message content, message reactions (emotional and cognitive), and disgust sensitivity predicted intentions to regulate the infected acquaintance's interactions and lifestyle ($R^2 = .79$) and participants' likelihood of telling others about the acquaintance's infection ($R^2 = .35$). The findings generally provided support for MSC and directions for improvement.

Keywords

stigma; interpersonal communication; infectious disease; experiment

One common claim in stigma research (Goffman, 1963; Link & Phelan, 2001) is that stigmas are socialized. Stigmas are *communicated* to and among community members to socialize them on how to recognize the stigmatized and to enact the required devaluation of them (Smith, 2007, 2011). Until recently, there has been no theoretical guidance on why the content in some health messages shared with the public trigger stigma-related processes, while others do not. The model for stigma communication (Smith, 2007) provides such guidance, but its tests to date have been limited to an intergroup perspective.

Stigmas are built from stereotypes (Smith, 2007, 2011), that is, fixed, simplified conceptions about a group and its members (Ashmore & Del Boca, 1981). Stigma's foundation in stereotypes may explain why stigma-related communication and stigmatization are often studied as intergroup phenomena. Clearly, stigmas influence intergroup relationships and interactions, but they may also influence interpersonal communication and actions. Indeed,

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the first time stigma was presented in a communication journal, Thompson and Seibold (1978) focused on the interpersonal interactions of college students in which a confederate represented a stigmatized group and the participant did not (referred to as “normals” by Goffman, 1963, p. 5 and the authors in the study). Thompson (1981, 1982) continued to study interpersonal expressions of stigmatization for a few years. Since that time, stigma research as a whole and communication research on stigma in particular has stopped attending how stigmatization performed in interpersonal encounters, much less how communication evokes such actions, and instead focused on psychological aspects of identity, disclosure of stigmatized conditions to others, and interpersonal means to cope with existing stigmas.

To address this omission, this study replicates and extends a previous test (Smith, 2012) of the model of stigma communication (MSC, Smith, 2007, 2011) by shifting the scenario to refer to a hypothetical acquaintance instead of the social group of infected persons. By shifting the focus to thoughts, discussions, and intentions to regulate a particular person’s actions (vs. groups of people), we can discover the robustness of the model of stigma communication (Smith, 2007, 2011) and its boundaries. By exploring MSC in an interpersonal context, new affective states, sympathy and frustration, are included in the model. This extension also includes an alternative explanation for intentions to regulate another’s life and to spread their disease status: the threat of the infection itself. The perceived severity and susceptibility to the infection are included, to assess its separation from perceiving an infected person as dangerous. Last, a different personality trait (disgust sensitivity) was tested as possible additions to MSC. The next sections briefly review MSC and Smith’s (2012) earlier experiment, and then describe the new additions considered for an interpersonal context.

Model of Stigma Communication

The MSC (Smith, 2007, 2011, 2012) provides an explanation as to why four different types of content – marks, labels, responsibility, and peril – are instrumental in forming stigma beliefs, encouraging people to share stigma messages with others, and encouraging people to take actions to regulate stigmatized groups’ interactions with the general public. Marks, labels, responsibility and peril help focus attention, and they lead to thinking about stigmatized persons as a separate social group, stereotyping them perceiving them as responsible for stigmatized group membership, perceiving them as dangerous, and evoking feelings of fear, anger, and disgust. A primary assumption underlying the MSC is a sociofunctional perspective: stigmas evolved in humans (and other species) as a means to protect group survival (Neuberg et al., 2000). Stigmas may be attached to a variety of conditions and actors historically and globally, but the consistent thread is that “people will stigmatize those individuals who[se] characteristics and actions are seen as threatening or hindering the effective functioning of their groups” (Neuberg, Smith, & Asher, 2000, p. 34).

While the fundamental premise of stigmas may be in promoting groups and the basis of stigmas in stereotypes about groups of people, the enactment of stigmatization is likely to occur in interpersonal encounters. One common claim in stigma research is that stigmas are socialized (Goffman, 1963; Link & Phelan, 2001). Stigmas are *communicated* to and among

community members to socialize them on how to recognize the stigmatized and to enact the required devaluation of them (Smith, 2007, 2011). While stigmatization may be performed in intergroup contexts, it is likely to occur interpersonally. Indeed, such interpersonal encounters were the initial focus on communication research into stigmas (Thompson & Seibold, 1978), and an important advance in stigma research. These early studies, focusing largely on the stigma of physical disabilities, showed that participants interpersonally distanced themselves more from stigmatized confederates than from nonstigmatized ones (college student sample, Thompson & Seibold, 1978), did not adapt their communication to stigmatized interactants (elementary school sample, Thompson, 1981), and left stigmatized people waiting longer for restaurant service, interacted with them less, provided eye contact for shorter periods of time, and stared at them longer than unstigmatized people (Thompson, 1982). Meisenbach's (2010) more recent attention to how stigmatized people use communication strategies to manage interpersonal encounters provides needed attention to everyday encounters with stigmatization. What is needed is a return to studying the interpersonal expressions of stigmatization (see Sunwolf & Leets, 2004 for peer group rejection), and particularly, an understanding of why communication can encourage people to stigmatize others in their interpersonal interactions.

Infectious disease

In the first comprehensive experiment testing the MSC, Smith (2012) tested MSC in reference to infectious disease. Smith argued that infectious diseases challenge group functioning through sickness or death of group members and pointed out that many infectious diseases are stigmatized in the United States (e.g., Des Jarlas, Galea, Tracy, Tross, & Vlahov, 2006). In addition, infectious diseases may be particularly threatening to groups because the infectious agents spread through interpersonal contact. Pathogens evolve to take advantage of their hosts' contact patterns (Messinger & Ostling, 2009), for example, when hosts (e.g., humans) has more local interactions (within small groups) and lower reproduction rates, pathogens evolve to have lower transmission rates and lower virulence than when their hosts interact with a larger, diverse community. This evolution helps pathogens not to burn through their hosts before they can reproduce and infect others.

Infectious diseases are an important context in which to test MSC's predictability; the findings have practical importance as well. Holmes (2008) describes (a) worldwide interest in developing effective communication strategies in crisis plans for infectious disease outbreaks, (b) little theory-driven communication research into the effects of alerts, and (c) an exclusive focus in the existing research on disease-related effects. Current research presumes that "the only enemy is the disease" (Holmes, 2008, p. 351), even when other research shows that post-disaster stigmatization of infected persons is damaging (e.g., Barrett & Brown, 2008). In the first experiment, Smith (2012) showed how changing the content of a health alert shaped stigma-related outcomes, predicted by MSC-predicted mediators. The current study, then, presents a means by which to theoretically anticipate and avoid iatrogenic effects of disease alerts and to understand the role of communication in creating stigmas and invoking stigma-related processes. For these reasons, infectious diseases may be particularly salient topics for testing stigma-related theories (Smith, 2012).

Infectious diseases also map onto the four content cues discussed in MSC, which are briefly reviewed next.

MSC content

The MSC describes four types of content relevant for stigma communication: marks, labels, responsibility, and peril. Marks are content describing ways to identify members of a stigmatized group. To be most effective, marks are visible, disgusting features, so that they can be recognized quickly and remembered easily, and they trigger removal and isolation (Smith, 2007, 2011). Labels are terms used to refer to the stigmatized group. To be most effective, labels include the danger associated with the group. Labels arouse social cognitions, such as considering the stigmatized persons as a distinct group, highlighting intergroup differences, encouraging categorization and promoting stereotypes (Smith, 2007, 2011). Responsibility is content that describes people's agency, awareness, and opportunity in choosing to be members of the stigmatized group. To be most effective, responsibility content suggests the person voluntarily and actively decided to violate social responsibilities and engage in taboo activities. Attributions of responsibility assist with developing stereotypes about stigmatized people as morally flawed and undeserving of normal rights as a group member, because they intentionally put others at risk. It also evokes anger, which motivates people to aggressively destroy or remove the target of anger (Mackie & Smith, 2002). Peril is content that describes the physical or social threat to a community's effective functioning brought by the stigmatized. To be most effective, the peril is painful, lethal, and socially taboo. For example, syphilis is painful, potentially fatal, and associated with sexual promiscuity, taboo in particular communities.

MSC reactions

Content associated with marks, labels, responsibility, and peril promote stigma-related outcomes because they encourage particular cognitive and emotional reactions. These four types of message content make social cognitions salient, assist with stereotyping, and promote inter-group differences (Smith, 2007). The cognitive reactions tested in the seminal experiment (Smith, 2012) included perceived dangerousness, attributions of responsibility, and group entitativity. Of these, perceived dangerousness was predicted most strongly by message content, and was the strongest predictor of stigma-related outcomes. Attributions of responsibility were not predictive at all, and group entitativity predicted only one stigma-related outcome. The three emotions argued to arise from MSC content are disgust, anger, and fear. In the earlier study (Smith, 2012), the three emotions were strongly correlated and considered together as negative affect. Negative affect was also predictive of stigma-related outcomes.

MSC effects

Smith (2007, 2012) has focused primarily on three stigma-related outcomes: developing stigma attitudes, isolating and removing stigmatized persons, and sharing stigma messages with other people in one's social network. As stated earlier, stigmas are based on stereotypes; thus the stereotyping processes directly promote development of stigma attitudes. The perceptions of dangerousness and responsibility are potent components of a

stereotype that casts stigmatized groups as separate groups of social deviants putting the rest of the community at risk, thus developing the stigma attitude.

Consistent with a sociofunctional framework, disgust, anger, and fear (studied together as negative affect) are argued to be basic emotions that automatically encourage humans to respond in ways that promote their survival (Ekman, 1999; Lazarus, 1991). Disgust, fear, and anger encourage isolating and removing the threatening agent or oneself. These emotions have also been associated with cognitive reactions, such as paying attention to the emotion-inducing object and elaborating more on messages about it (DeTurck, 2002; Roser & Thompson, 1995). This encourages attitude development and accessibility (Roskos-Ewoldsen, Yu, & Rhodes, 2004), which also increases attention to and elaboration on messages (e.g., Roskos-Ewoldsen & Fazio, 1992). Thus, the cognitive and emotional reactions promote the development of stigma attitudes, likelihood of regulating stigmatized persons' interactions with the community and lifestyle to protect the group, and sharing the stigma message widely to mobilize collective action. Notably, people may find it appealing to share stigma messages because these cognitive and emotional reactions spur social bonding (Smith, 2007).

Interpersonal Considerations

An important, relatively unexplored question is how stigma-related processes play out in an interpersonal context. One way to explore the differences is to reframe the outcomes from regulating a hypothetical group of infected, unknown people to a known relation, such as an acquaintance and from sharing a broad health alert with others, to specifically sharing the infected acquaintance's disease state with others, such as neighbors, friends, or even social contacts (e.g., posting on a Facebook wall).

The interpersonal context may differ, in that people can make exceptions for a person without changing stigma attitude (e.g., Brewer, 1988; Smith, 2007). It is possible that the MSC may not extend to interpersonal scenarios. The interpersonal context allows some reflection on the mechanisms in the MSC. Different interpretations of the affective reactions in the MSC may be seen in frustration, disgust sensitivity, and sympathy.

Frustration

Anger and disgust are both labeled as other-condemning emotions, associated with violations or threats to the social living needed by many species (including humans) to survive (Haidt, 2003). Anger with another person may be referred to as frustration. Further, frustration is aroused when the other person has blocked a goal (associated with anger) with no justification or rights. Frustration, then, may represent the emotional state associated with cognitive attributions of dangerousness and personal responsibility. Frustration may be a better way of understanding anger in stigmatization. While general anger is associated with attacking the blocking obstacle, anger with others (i.e., frustration) is associated with the action tendencies to publically humiliate the offender, enact revenge, or retaliate (Haidt, 2003).

Disgust sensitivity

Disgust is an emotional reaction of offense at an object or a person (Haidt, 2003). Disgust, when elicited by people, is associated with the action tendency of ostracism and condemnation. Some people find the experience of disgust to be more unpleasant than do others, an interpretation which has been referred to as disgust sensitivity (van Overveld, de Jong, Peters, Cavanagh, & Davey, 2006). Studies show that more sensitive people feel disgust in reaction to more kinds of stimuli than others, and exhibit stronger reactions, such as fainting (van Overveld et al., 2006). Those with higher disgust sensitivity may have stronger reactions to stimuli and greater intentions to regulate an infected person's life as a means of defense.

Sympathy

While disgust, anger, and fear have been labeled as primary emotions, others such as sympathy are referred to as moral emotions (Haidt, 2003). Sympathy is described as being able to take on another's perspective and feel concern for them, or to vicariously feel their emotional state of misery, suffering or sorrow (Haidt, 2003). Sympathy is associated with an action tendency to alleviate the other person's reason for suffering or to provide them comfort.

Alternative Explanation: Disease Threat

As noted earlier, the key predictor in the MSC experiment (Smith, 2012) was perceived dangerousness. The peril, marks, and transmission content have parallels to content argued to invoke perceived threat of a condition (Witte, 1992). To create high or low threat messages, threat content varies in its vivid language ("bleeding, oozing sores all over his body," p. 120) and the severity of the health outcome (e.g., Witte, Meyer, & Martell, 2001). It is reasonable, then, to question whether regulation of an infected acquaintance and dissemination of their infected status is a function of perceived dangerousness of the acquaintance as a character flaw, or perceived threat of infection. It is possible that perceived threat of infection, not perceived dangerousness of the infected person, is the better predictor of regulation and dissemination.

Methods

Participants

Participants ($N = 318$, 58% female, 42% male, 0.3% unidentified) on average were 36 years old ($Mdn = 32.50$, $SD = 12.19$, $Minimum = 18$, $Maximum = 74$). Participants were recruited through Amazon's Mechanical Turk (M*Turk), which provides access to a diverse, stable pool of adults (Mason & Suri, 2011). Importantly, studies comparing results provided by M*Turk samples, online samples recruited through discussion board, subject pools from universities, and showed no meaningful differences, which suggests that the study results from M*Turk samples generalize well to other recruitment formats (see Mason & Suri, 2011 for a review). Participants identified their race as White (81%), African American (7%), Asian (6%), American Indian or Alaska Native (1%), Native Hawaiian or Pacific

Islander (1%); three percent did not report a racial identification. Five percent identified their ethnicity as Hispanic.

Design

The study is a 2 (marked: yes or no) x 2 (labeled: yes or no) x 2 (responsibility [via transmission]: mouse-only [high responsibility] or airborne [low responsibility]) x 2 (peril: high or low) between-subject, post-test only design. The stimulus was adopted from Smith (2012). The stimulus is based on CDC newsroom reports of hantavirus pulmonary syndrome, but was given a fictitious name – cautela acervusary virus (CAV; see Smith, 2012 for a full description of the stimulus conditions). The disease was described as creating open sores on arms with a loud, wet cough (marked) or with no visible symptoms (no mark). Infected people were referred to as Cavers (labeled) or as people infected with CAV (no label). Transmission was described as via direct contact with infected mouse feces (mouse-borne) or also between persons through sneezed or coughed droplets (airborne potential). In both messages, mice were mentioned as a vector for disease transmission. The disease was described as painful, incurable, and often fatal, with possible paranoid delusions and aggression (high peril) or as mildly comfortable, curable, nonfatal, with no mental changes (low peril).

Procedures

An institutional review board approved the study. The procedures follow those in Smith (2012). This study was conducted through M*Turk (see Mason & Suri, 2011 for guidance on how to use this system). Briefly, adults willing to complete tasks, such as participating in research studies, register with M*Turk and create an Amazon Payment account to receive payment for their efforts. Researchers post opportunities for research (referred to as HITs) and list criteria for inclusion; this research opportunity was restricted to US citizens and compensation was \$1.50. In this study, compensation was provided when participants reported a code found at the end of the survey. Further, participants were compensated even if they did not answer every question in the survey.

After giving consent, the online survey instructions stated that the participants would be presented with a message under consideration for future public-health alerts and that the condition is a fictitious representation of existing illnesses. The participants were asked to consider the message's content (as opposed to delivery). Participants were shown one of the 16 possible messages through random assignment (about 19 participants per cell). Participants were asked to rate the believability, credibility and interestingness of the message right after reading it. These ratings did not vary by condition ($F < 1$ for each of the three ratings). According to G*Power, the power to detect an effect size for an F of .25 (medium sized), $\alpha = .05$, numerator $df = 22$ (all main and interaction effects and mediators assuming fixed effects) is .95.

After reading the message, participants were asked to imagine that someone known to the participant, referred to as "Pat" had contracted the hypothetical infectious disease. Participants were asked to imagine that they have spent time with Pat, but Pat is not one of

the participant's close friends. Participants were asked to complete the scales below with this fictitious acquaintance in mind.

Measurement

A confirmatory factor analysis of scales – perceived dangerousness, perceived responsibility, sympathy, frustration, perceived severity, perceived risk, intervention support, dissemination likelihood, and disgust sensitivity – was estimated with maximum likelihood; all factors were allowed to covary, but error terms were not. This model showed reasonable goodness of fit (Holbert & Stephenson, 2002): $RMSEA = .07$ [90% CI: .07, .08], $SRMR = .08$, with χ^2 ($df = 989$, $N = 318$) = 2388.38, $p < .001$. The measurement model reported in the initial experiment (Smith, 2012) also had reasonable goodness of fit. Independent variables had two levels; all main effects and interactions in the experimental condition received effect codes (1, -1).

Adapted from Smith (2012), *perceived dangerousness* was measured via four items assessing perceptions of the fictitious, infected acquaintance (Pat) as dangerous (e.g., putting others in danger and dangerous to be around) (e.g., *Pat is no more dangerous than the average person* [reverse coded]) ($\alpha = .88$). *Perceived responsibility* was measured using three items ($\alpha = .89$) to assess the fictitious, infected acquaintance's (Pat's) responsibility for contracting CAV (e.g., *I would hold Pat responsible for getting CAV*). *Intervention support* was measured via six items ($\alpha = .93$) to assess how much participants agreed with six different intervention options for their fictitious, infected acquaintance (Pat), if this were a real situation (e.g., *I would want Pat's movements through the community to be monitored and reduced; If Pat tried to come to work, I would want someone to tell him to go home*). These six options included quarantining the infected acquaintance at a health facility, isolating their infected acquaintance from everyone, watching and limiting his/her movements through the community by officials, for having someone tell him/her to go home if he/she came to work, avoiding touching anything he/she touched, and keeping him/her away from the participant's family. Responses for each of these scales were marked on five-point scales (1 = *strongly disagree* to 5 = *strongly agree*), and averaged into one score, with higher scores indicating greater amounts of the specific constructs.

Three items each were used to assess *sympathy*, or how strongly participants felt pity, concern, and sympathy for their fictitious, infected acquaintance (Pat) (e.g., *I would feel sympathy for Pat*) and *frustration*, or how strongly participants felt angry, irritated, and aggravated with their fictitious, infected acquaintance (Pat) (e.g., *I would be irritated with Pat*). Responses to each were marked on five-point scales (1 = *strongly disagree* to 5 = *strongly agree*) and averaged into one score, with higher scores indicating stronger sympathy ($\alpha = .91$) or frustration ($\alpha = .93$), respectively.

Adapted from Witte et al. (2001), three items assessed the *perceived severity* of CAV (e.g., *I believe that CAV is severe*) ($\alpha = .95$) and three items measured *perceived susceptibility*, or the the perceived risk of contracting CAV (e.g., *I am at-risk for getting CAV*) ($\alpha = .80$). Responses, marked on five-point scales (1 = *not at all* to 5 = *very much*), were averaged into one score, with higher scores indicating stronger perceived severity or susceptibility.

Adapted from Smith (2012), to measure *dissemination likelihood*, participants were asked to mark the likelihood that they would share this message, if this were a real situation, with neighbors, friends, or by posting on a Facebook wall (or other social media) (e.g., *What is the likelihood that you would share this message with other people? Specifically, what is the likelihood that you would tell...*). Participants marked their responses for each type on six-point scales (1 = *very unlikely* to 5 = *very likely*) or a sixth option for *not applicable*. Responses marked as not applicable were considered as missing data and were removed before averaging into one score ($\alpha = .71$), with higher scores indicating stronger likelihood of dissemination.

Finally, seven items derived from van Overveld et al. (2006) assessed how negatively people perceive the experience of disgust (e.g., *When I feel disgusted, I worry that I might pass out*). Responses, marked on five-point scales (1 = *never* to 5 = *always*) were averaged into one score ($\alpha = .89$), with higher scores indicating stronger sensitivity.

Results

Descriptive Statistics

Table 1 presents the descriptive statistics for the variables in this study. Overall, one sample *t*-tests indicated that participants did not perceive the fictitious, infected, acquaintance (Pat) as dangerous, $t(317) = -5.67, p < .05$, or as responsible for being infected, $t(317) = -15.44, p < .05$. Participants reported feeling sympathy for their infected acquaintance, $t(317) = 18.72, p < .05$, but not frustrated with him/her, $t(317) = -21.01, p < .05$. They judged CAV as a serious infection, $t(317) = 8.19, p < .05$. They provided a neutral rating about their susceptibility to contracting CAV, $t(317) = 1.42, ns$. They reported infrequent experiences with disgust sensitivity, $t(317) = -6.46, p < .05$.

On average, participants provided neutral support for intervening in their infected acquaintance's life, $t(317) = -1.90, ns$. That said, 47% of participants provided scores above the mid-point (greater than 3), indicating their support for regulating their infected acquaintance. On average, participants were unlikely to share the infected acquaintance's diagnosis and disease state with others, $t(317) = -2.21, p < .05$. That said, 38% of participants provided scores above the mid-point (> 3); they were likely to share the acquaintance's disease state with others.

Message Effects on Cognitive and Affective Responses

A series of regressions were conducted to assess the effects of the message content and disgust sensitivity on the cognitive and affective responses (see Table 2). Effect codes (1, -1) were created for all of the main effects and interactions among the message conditions: mark, label, transmission, and peril.

Perceived dangerousness—The regression for perceived dangerousness was statistically significant, $F(16, 301) = 10.81, p < .05, R^2 = .37$. Two main effects (peril and transmission), the peril-by-transmission interaction, and disgust sensitivity were statistically significant. The interaction was explored by comparing means after controlling for disgust sensitivity: perceived dangerousness was particularly low for the mouse-borne, low-peril

condition ($M = 1.87$, $se = 0.11$); higher for the mouse-borne, high-peril condition ($M = 2.27$, $se = 0.11$); higher for the airborne, low-peril condition ($M = 2.71$, $se = 0.11$); and higher for airborne, high-peril conditions ($M = 3.55$, $se = 0.10$). In addition, those reporting more disgust sensitivity were more likely to judge their infected acquaintance as a more dangerous person.

Perceived responsibility—The regression for perceived responsibility was not statistically significant, $F(16, 301) = 1.37$, ns , $R^2 = .07$. While the overall model was not significant, the beta weight for disgust sensitivity was: those reporting more sensitivity were more likely to hold their acquaintance responsible for contracting the infectious disease.

Sympathy—The regression for sympathy was statistically significant, $F(16, 301) = 3.61$, $p < .05$, $R^2 = .16$. Two main effects (label and peril) and disgust sensitivity were statistically significant. Participants reported more sympathy for their hypothetical acquaintance after reading group labels for infected people and high-peril disease descriptions in comparison to no-labels and low-peril descriptions. In addition, those reporting more disgust sensitivity were more likely to feel sympathy for their infected acquaintance.

Frustration—The regression for frustration was statistically significant, $F(16, 301) = 2.14$, $p < .05$, $R^2 = .10$. Two main effects (transmission and peril) and the covariate, disgust sensitivity, were statistically significant. Participants reported more frustration with the hypothetical acquaintance after reading airborne-transmission and high-peril disease descriptions in comparison to mouse-vector transmission and low-peril descriptions. In addition, those with more disgust sensitivity were more likely to feel frustration toward the infected acquaintance.

Perceived severity—The regression for perceived severity was statistically significant, $F(16, 301) = 21.77$, $p < .05$, $R^2 = .54$. Two main effects (mark and peril), the mark-by-peril interaction, and disgust sensitivity were statistically significant. Participants judged the infectious disease as more serious after reading visible-symptoms and high-peril disease descriptions in comparison to invisible-symptoms and low-peril descriptions. The interaction was explored by comparing means after controlling for disgust sensitivity: perceived seriousness was particularly low for the unmarked, low-peril condition ($M = 2.41$, $se = 0.10$), higher for the marked, low-peril condition ($M = 2.94$, $se = 0.11$), and very high for unmarked or marked, high-peril conditions ($M = 4.52$, $se = 0.11$ and $M = 4.54$, $se = 0.10$, respectively). In addition, those reporting more disgust sensitivity were more likely to judge CAV as more serious.

Perceived susceptibility—The regression for perceived susceptibility was statistically significant, $F(16, 301) = 2.17$, $p < .05$, $R^2 = .10$. One main effect (transmission) and the covariate, disgust sensitivity, were statistically significant. Participants judged themselves as more likely to contract the infectious disease (CAV) after reading airborne-transmission disease descriptions in comparison to mouse-vector transmission. In addition, those reporting more disgust sensitivity perceived themselves as more likely to contract CAV.

Stigmatization Processes: Regulation and Diffusion

Two regressions were conducted to assess the effects of the message content, cognitive and affective responses, and disgust sensitivity on participants' intention to regulate the infected acquaintance's interactions and lifestyle and on participants' likelihood of telling others about the acquaintance's infection (see Table 3). The regression for regulation support was statistically significant, $F(20, 295) = 48.98, p < .05, R^2 = .79$. Four predictors were statistically significant: transmission content, perceived dangerousness, sympathy, and frustration. Participants reading the airborne (versus mouse-vector) transmission description who perceived the infected acquaintance as more dangerous and felt more sympathy and frustration reported stronger intentions to regulate the infected acquaintance's interactions and lifestyle. The regression for dissemination likelihood was statistically significant, $F(20, 295) = 7.17, p < .05, R^2 = .35$. Three predictors were statistically significant: perceived dangerousness, frustration, and perceived susceptibility. Participants who perceived the infected acquaintance as more dangerous, reported more frustration, and perceived themselves as more likely to contract the infection reported stronger intentions to tell their neighbors, friends, and post on their social media sites the news of the acquaintance's infection.

Post-hoc review of open-ended responses—After reading the message, participants were asked what they might tell someone else if CAV were a real infection and they had received this alert during a real outbreak. Specifically, participants were asked “In your own words, what are you likely to tell them?” (“them” refers to others with whom they may share the alert). They could no longer see the experimental message when they wrote in their answers. Almost everyone (98%) wrote in a response to this open-ended question. After reading their answers, the word “rat” was noticed. For example, one participant wrote “Wash hands frequently, stay apart from someone coughing, cook food thoroughly, and avoid rat-infested areas.” Another wrote “I would tell them a dangerous disease is being spread by rats, which is then being spread by people who catch it.” MS Excel was used to search for the words “rat” or “rats.” Importantly, 15% of those who wrote in responses incorrectly identified rats as the animal-vector, when only mice were mentioned in the alert. As a reminder, the experimental messages described transmission via direct contact with infected mouse feces (mouse-borne) or also between persons through sneezed or coughed droplets (airborne potential). In both messages, mice were mentioned as a vector for disease transmission. The inaccurate responses appeared after reading only mouse-vector or airborne potential, $\chi^2(1, 318) = 1.52, ns$. Importantly, people who made this misattribution judged their infected acquaintance as more dangerous than those who did not make this error, $F(1, 316) = 3.69, p < .05$. The error was not associated with any other differences in the key variables.

Discussion

Until the MSC (2007) was introduced, stigma research was missing theoretical guidance on why communication content can create stigmas and evoke stigmatization in various forms, including the diffusion of stigma messages to others. While the MSC provided unique guidance and re-energized communication research into stigmas (Meisenbach, 2010), initial

tests of it limited their scope to intergroup phenomena at the omission of interpersonal ones. This study presented an attempt to extend MSC to an interpersonal context by reframing the question to consider an infected acquaintance, instead of an unknown group of infected people, and including sympathy and frustration as affective reactions. It also included an alternative explanation for stigma-related intentions (regulating an infected acquaintance's life and sharing their disease status) by including both perceptions of the infection's threat and the person's dangerousness. Last, a personality trait, disgust sensitivity, was tested. The findings showed marked support for MSC; the findings replicated those in Smith's earlier experiment (2012) well suggesting that the MSC is not limited to intergroup boundary. Frustration, as an affective reaction to the infected acquaintance, was a particularly consistent predictor of both regulation support and dissemination likelihood. While perceived dangerousness of the infected acquaintance was correlated with perceived severity, but not susceptibility, of the infection, only perceived dangerousness predicted regulation and dissemination. Disgust sensitivity was a powerful, consistent predictor of participants' cognitive and affective reactions after reading a version of the experimental message.

Predicting Regulation and Dissemination

Consistent with the first test of the MSC (Smith, 2012), perceived dangerousness of the infected acquaintance was by far the strongest and most consistent predictor of participants' support for regulating their acquaintance's life and lifestyle and for sharing an acquaintance's infection status with neighbors, friends, and social media contacts. Whereas perceived dangerousness was not explicitly studied in previous studies of interpersonal expressions of stigmatization, it has been discussed regarding stigmatizing media portrayals of mental illness (e.g., Wahl, Wood, & Richards, 2002; Wilson, Nairn, Coverdale, & Panapa, 2000).

Notably, perceived severity of the infection did not predict either regulation or dissemination. Perceived susceptibility did not predict regulation either. These finding provides additional evidence that contagiousness is not the driving force for regulating another's life. While quarantining may be useful for some infectious diseases, it is only useful to the extent that it limits transmission. The fact that severity of and susceptibility for contracting CAV was not predictive of regulating the infected acquaintance's life shows less support for participants' regulation responses as a rational, public-health reaction to limiting contagion and spread, and shows more support for stigmatization.

Interestingly, while susceptibility did not predict regulation, it predicted dissemination: as participants judged themselves as more likely to contract the hypothetical infectious disease, they reported more likelihood of sharing the infected acquaintance's status with others. Increased susceptibility may have made the acquaintance's disease state better fodder for the rumor mill: greater susceptibility to infection may spur social bonding over shared concerns and shared condemnation (Smith, 2007).

A smaller, but consistent predictor of regulation and dissemination was frustration with the infected acquaintance. Frustration was positively correlated with both perceived dangerousness and perceived responsibility. While perceived responsibility did not predict

the two outcomes (as it did not in Smith, 2012), frustration may be a better way to understand the blame and anger felt toward stigmatized persons. Frustration predicted greater dissemination of the infected acquaintance's infection status, which may be how people enact public humiliation or revenge associated with frustration (Haidt, 2003). Indeed, sympathy was not protective for the infected acquaintance: it was unrelated to dissemination and positively predicted regulation. Even though people feel sympathy for an infected acquaintance, they may support regulating lives and lifestyles, invading otherwise personal rights in the U.S. context of this study.

Content Drivers of Key Cognitive and Affective Reactions

Peril, transmission, and label content evoked the key mechanisms explaining regulation and dissemination: perceived dangerousness, frustration, susceptibility, and sympathy. Perceived dangerousness and frustration were higher after reading high-peril versus low-peril content, as expected (and consistent with Smith, 2012). In addition, diseases described with airborne transmission, versus only through mouse-borne transmission, evoked stronger attributions of the infected acquaintance as dangerous and more frustration with him or her. Consistently, then, although people may have more control or choice over contracting an infection via contact with mice feces, in contrast to contact with coughed or sneezed droplets, participants were more frustrated with acquaintances who contracted airborne infections. One possibility is that contact with cough or sneezed droplets may be associated with hygiene, which is under one's control. Further, the mouse-borne description, as noted in open-ended comments, was often misattributed to rats, which may signal class-differentiations. Indeed, those who made the rat misattribution perceived their infected acquaintances as more dangerous than those who did not make the error. The findings highlight the complex nature in which disease transmission evokes attributions of dangerousness and feelings of frustration. It also highlights the work needed to understand the role, if any, of perceived responsibility. Indeed, only disgust sensitivity predicted participants' perceptions of their acquaintance as responsible or at fault for contracting the infection.

Perceived susceptibility was stronger after reading airborne versus mouse-vector only descriptions of the infection's transmission. This finding highlights people's lay understanding of transmission vectors, contagion, and susceptibility. Interestingly, those with stronger disgust sensitivity also perceived themselves as more susceptible to contracting the infection, which highlights a potentially important bias in lay understandings of disease etiology.

Stronger sympathy was associated with labeled (versus unlabeled) and high-peril (versus low-peril) content, and stronger disgust sensitivity. Sympathy should be evoked by taking the perspective of someone in dire circumstances (Haidt, 2003), supporting effects of high versus low peril. Those with stronger disgust sensitivity may be more able to consider another's perspective or may feel greater vicarious suffering when they do. The surprising finding was labeling, which had no effect on the mechanisms or outcomes of MSC, including group entitativity. By referring to infected people with a group label highlighting the infection, people should be more able to engage in categorizing and stereotyping processes, and to consider the stigmatized group as a distinct social entity, which Smith

(2012) did not find. This study shows that labels evoke sympathy. Further research is needed to understand labeling, because it seems unlikely that labels facilitate taking on another's perspective or feeling more vicarious suffering.

Limitations

This study is limited by its sample, the stimulus, and the focus. The sample, while diverse in age, still has limited representation of ethnic and racial diversity. The questions, while shifting from group to interpersonal, also shift from general to specific, which can affect social judgments (Schwarz & Sudman, 2012). This stimulus stated that message described a fictitious disease, based on existing diseases, and a fictitious outbreak, based on historical ones. Describing the disease and outbreak as fictitious could have alerted the results. Future research should attempt to study the MSC in real, emerging outbreaks. In addition, the stimulus represents the theoretical variables in specific ways; more studies are needed that vary responsibility in ways besides the transmission vector, and vary peril in physical symptoms and mental alterations. Many infectious diseases, however, have both physical and mental symptoms (e.g., human herpes viruses), so including them both is important for public health applications.

Further, this study limited its focus to understanding how (presumably) non-infected persons intend to respond to infected others. It is important, also, to understand how people may respond if they think they have the infection, and others might want to regulate their lives or to share their infection status. There is an assumption in efforts to use stigmatization to change behavior that this translation exists; this assumption needs to be tested and questioned. Just because people want others to be ostracized does not mean ostracism induces behavioral change. Indeed, evidence suggests that it induces secrecy, psychological pain, and delays in treatment (Smith, 2011). In addition, there may be contextual cues which encourage or inhibit performing stigmatization in interpersonal encounters, even if the stigma has been communicated and diffused in a community. Thompson and Seibold (1978) noted that those without the stigma may be caught between social expectations to perform stigmatization and yet not to appear too inhumane. People who do not stigmatized risk being seen as traitors or sympathizers, and be extended a stigma-by-association (also called courtesy stigma, Goffman, 1963); those that do risk being seen as inhuman (Thompson & Seibold, 1978). Understanding how people decide when and to what degree to enact stigmatization in interpersonal or intergroup communication is needed to continue to advance stigma research.

Conclusion

This study showed the theoretical potential and practical utility in the MSC and adds to existing understanding of the MSC by considering it within an interpersonal context. The hope of this theoretical work and these studies is to better understand stigmas and stigmatization, which are old, sociofunctional responses to threats to group living. This improved understanding represented by theoretical models like the MSC represents attending not only to communication's role in disclosing and coping with existing stigmas but to its role in creating stigmas and induces stigmatization. To continue to advance this

research, it is important to understand the stability and consistency in stigmas created by communication content, what makes them salient, and what makes them stronger predictors of interpersonal and intergroup behavior. It is clear that once stigmas are in place, they are very difficult to remove. Particularly with new conditions, with this theoretical guidance, we could avoid creating stigmas as we disseminate information about them to the public. Regulation and dissemination are predicted by attributions about and frustration with the infected person, not by infection-level threats (i.e., severity). While the MSC provides theoretical guidance on stigma creation, more attention is needed to interpersonal aspects to stigmatization, especially verbal and nonverbal means by which stigmatization occurs and how it affects those receiving it. While stigmas are clearly intergroup phenomena, stigmatization may be enacted in interpersonal communication and actions as well as intergroup ones.

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References

- Ashmore, RD.; Del Boca, FK. Conceptual approaches to stereotypes and stereotyping. In: Hamilton, DL., editor. *Cognitive processes in stereotyping and intergroup behavior*. Hillsdale, NJ: Lawrence Erlbaum; 1981. p. 16
- Barrett R, Brown PJ. Stigma in the time of influenza: Social and institutional responses to pandemic emergencies. *Journal of Infectious Diseases*. 2008; 197(Supplement 1):S34–S37.10.1086/524986 [PubMed: 18269326]
- Brewer, MB. A dual process model of impression formation. In: Srull, TK.; Wyer, RS., Jr, editors. *Advances in social cognition*. Vol. 1. Hillsdale, NJ: Erlbaum; 1988. p. 1-36.
- Des Jarlais DC, Galea S, Tracy M, Tross S, Vlahov D. Stigmatization of newly emerging infectious diseases: AIDS and SARS. *American Journal of Public Health*. 2006; 96:561–567.10.2105/AJPH.2004.054742 [PubMed: 16449597]
- DeTurck, MA. Persuasive effects of product warning labels. In: Dillard, JP.; Pfau, M., editors. *Persuasion: Developments in theory and practice*. Thousand Oaks, CA: Sage; 2002. p. 213-232.
- Ekman, P. Basic emotions. In: Dalglish, T.; Power, M., editors. *The handbook of cognition and emotion*. Sussex, England: Wiley; 1999. p. 45-60.
- Goffman, E. *Stigma: Notes on the management of spoiled identity*. Englewood Cliffs, NJ: Prentice-Hall; 1963.
- Haidt, J. The moral emotions. In: Davidson, RJ.; Scherer, KR.; Goldsmith, HH., editors. *Handbook of affective sciences*. Oxford, England: Oxford University Press; 2003. p. 852-870.
- Holmes BJ. Communicating about emerging infectious disease: The importance of research. *Health, Risk & Society*. 2008; 10:349–360.10.1080/13698570802166431
- Lazarus, RS. *Emotion and adaptation*. New York: Oxford University Press; 1991.
- Link BG, Phelan JC. Conceptualizing stigma. *Annual Review of Sociology*. 2001; 27:363–385.
- Mackie, DM.; Smith, ER. *From prejudice to intergroup relations: Differentiated reactions to social groups*. New York: Psychology Press; 2002.
- Mason W, Suri S. Conducting behavioral research on Amazon's Mechanical Turk. *Behavioral Research*. 2011; 44:1–23.10.3758/s13428-011-0124-6
- Meisenbach R. Stigma management communication: A theory and agenda for applied research on how individuals manage moments of stigmatized identity. *Journal of Applied Communication Research*. 2010; 38:268–292.10.1080/00909882.2010.490841

- Messinger SM, Ostling A. The consequences of spatial structure for the evolution of pathogen transmission rate and virulence. *The American Naturalist*. 2009; 174:441–454.10.1086/605375
- Neuberg, SL.; Smith, DM.; Asher, T. Why people stigmatize: Toward a biocultural framework. In: Heatherton, TF.; Kleck, RE.; Hebl, MR.; Hull, JG., editors. *The social psychology of stigma*. New York: Guilford Press; 2000. p. 31-60.
- Roser C, Thompson M. Fear appeals and the formation of active publics. *Journal of Communication*. 1995; 45:103–121.10.1111/j.1460-2466.1995.tb00717.x
- Roskos-Ewoldsen DR, Fazio RH. On the orienting value of attitudes: Attitude accessibility as a determinant of an object's attraction of visual attention. *Journal of Personality and Social Psychology*. 1992; 63:198–211.10.1037/0022-3514.63.2.198 [PubMed: 1403611]
- Roskos-Ewoldsen DR, Yu HJ, Rhodes N. Fear appeal messages affect accessibility of attitudes toward the threat and adaptive behaviors. *Communication Monographs*. 2004; 71:49–69.10.1080/0363452042000228559
- Schwarz, N.; Sudman, S. *Context effects in social and psychological research*. London, UK: Springer; 2012.
- Smith RA. Language of the lost: An explication of stigma communication. *Communication Theory*. 2007; 17:462–485.10.1111/j.1468-2885.2007.00307.x
- Smith, RA. Stigma communication and health. In: Thompson, TL.; Parrott, R.; Nussbaum, J., editors. *Handbook of health communication*. 2. New York: Taylor & Francis; 2011. p. 455-468.
- Smith RA. An experimental test of stigma communication features with a hypothetical infectious disease alert. *Communication Monographs*. 2012; 79:522–538.10.1080/03637751.2012.723811
- Sunwolf &, Leets L. Being left out: Rejecting outside and communicating group boundaries in childhood and adolescent peer groups. *Journal of Applied Communication Research*. 2004; 32:195–223.10.1080/0090988042000240149
- Thompson TL. The development of communication skills in physically handicapped children. *Human Communication Research*. 1981; 8:312–324.
- Thompson TL. Gaze toward and avoidance of the handicapped: A field experiment. *Journal of Nonverbal Behavior*. 1982; 6:188–196.
- Thompson TL, Seibold DR. Stigma management in “normal”-stigmatized interactions: Test of the disclosure hypothesis and a model of stigma acceptance. *Human Communication Research*. 1978; 4:231–242.
- van Overveld WJM, de Jong PJ, Peters ML, Cavanagh K, Davey GCL. Disgust propensity and disgust sensitivity: Separate constructs that are differentially related to specific fears. *Personality and Individual Differences*. 2006; 41:1241–1252.10.1016/j.paid.2006.04.021
- Wahl OF, Wood A, Richards R. Newspaper coverage of mental illness: Is it changing? *Psychiatric Rehabilitation Skills*. 2002; 6:9–31.
- Wilson C, Nairn R, Coverdale J, Panapa A. How mental illness is portrayed in children's television: A prospective study. *British Journal of Psychiatry*. 2000; 176:440–443. [PubMed: 10912219]
- Witte K. Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*. 1992; 59:329–349.10.1080/03637759209376276
- Witte, K.; Meyer, G.; Martell, D. *Effective health risk messages*. Thousand Oaks, CA: Sage; 2001.

Table 1

Descriptive Statistics and Correlations among Variables (N = 318)

	M	SD	Range	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Mark	-0.04	1.00	--												
2. Label	0.03	1.00		.00	--										
3. Mouse	-0.04	1.00		.07	.02	--									
4. Peril	0.03	1.00		.05	.08	-.01	--								
5. Dangerousness	2.63	1.15	4.00	-.03	.06	-.46*	.27*	--							
6. Responsibility	2.17	0.96	4.00	-.07	.07	.06	-.04	.21*	--						
7. Sympathy	3.96	0.92	4.00	.07	.11*	-.08	.24*	.28*	-.17	--					
8. Frustration	1.84	0.98	4.00	-.04	.03	-.11*	.13*	.51*	.57*	-.09	--				
9. Severity	3.61	1.33	4.00	.14*	.06	-.01	.71*	.42*	.04	.41*	.22*	--			
10. Susceptibility	3.07	0.92	4.00	-.09	.02	-.18	.04	.13	-.05	.10	.05	.04	--		
11. Intervention	2.87	1.25	4.00	.01	.11*	-.49*	.27*	.86*	.23*	.29*	.51*	.41*	.17*	--	
12. Dissemination	2.84	1.27	4.00	.07	.04	-.17*	.16*	.50*	.17*	.23*	.36*	.29*	.22*	.52*	--
13. Disgust sensitivity	2.67	0.90	3.86	.04	.03	.02	-.02	.16*	.16*	.22*	.20*	.09	.12*	.16*	.23*

*
p < .05

Table 2
Standardized Regression Estimates of Message Conditions on Cognitive and Affective Responses

	Dangerous	Responsible	Sympathy	Frustration	Severity	Susceptibility
Mark	.00	-.06	.05	-.03	.10*	-.08
Label	.05	.07	.12*	.03	.01	.02
Transmission	-.46*	.06	-.09	-.12*	-.02	-.19*
Peril	.27*	-.04	.23*	.14*	.69*	.05
Mark* Label	-.09	.03	-.05	-.06	-.01	-.02
Mark* Trans	.03	.01	.07	-.02	.03	.04
Mark* Peril	-.09	-.10	-.09	-.07	-.10*	-.09
Label* Trans	.08	.04	.00	.09	.05	.06
Label* Peril	.03	-.04	-.07	.03	.00	-.03
Trans* Peril	-.12*	-.04	.07	-.04	.01	-.01
Mark* Label* Trans	-.03	.01	-.02	-.03	.04	-.07
Mark* Label* Peril	-.02	-.04	.06	-.08	.03	.08
Label* Trans* Peril	-.01	-.04	-.06	.02	-.05	.07
Mark* Trans* Peril	-.09	.02	.02	-.05	.00	-.08
M* L* T* P	-.01	.08	-.07	.04	-.06	-.08
Disgust Sensitivity	.17*	.18*	.24*	.20*	.11*	.14*
<i>R</i> ²	.37*	.07	.16*	.10*	.54*	.10*

* $p < .05$

Table 3

Regression Estimates for Regulation Support and Dissemination Likelihood

	Regulation Support			Disclosure Likelihood		
	b	se	β	b	se	β
Mark	.06	.03	.05	.11	.06	.08
Label	.06	.03	.05	.00	.06	.00
Transmission	-.23	.04	-.18*	.08	.07	.07
Peril	.03	.05	.02	-.04	.09	-.03
Mark* Label	-.04	.03	-.04	.01	.06	.01
Mark* Trans	.03	.03	.02	.05	.06	.04
Mark* Peril	-.01	.04	-.01	.02	.06	.02
Label* Trans	.02	.03	.02	.04	.06	.03
Label* Peril	-.02	.03	-.02	.03	.06	.02
Trans* Peril	-.04	.03	-.03	.07	.06	.06
Mark* Label* Trans	.00	.03	.00	.13	.06	.10
Mark* Label* Peril	-.03	.03	-.03	-.02	.06	-.02
Label* Trans* Peril	.04	.03	.03	-.05	.06	-.04
Mark* Trans* Peril	.02	.03	.02	.02	.06	.02
M* L* T* P	.01	.03	.01	-.05	.06	-.04
Dangerousness	.70	.04	.65*	.44	.08	.40*
Responsibility	.06	.05	.04	.02	.08	.01
Sympathy	.10	.05	.07*	.11	.08	.08
Frustration	.15	.05	.12*	.17	.09	.13*
Severity	.05	.04	.05	.04	.07	.05
Susceptibility	.05	.04	.04	.24	.07	.17*
Disgust Sensitivity	.01	.04	.01	.13	.07	.09
R^2	.79*			.35*		

* $p < .05$.