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# The Influence of Stigmatizing Messages on Danger Appraisal: Examining the Model of Stigma Communication for Opioid-Related Stigma, Policy Support, and Related Outcomes

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## ABSTRACT

Drug overdose is a leading cause of injury and death in the United States, and opioids are among the most significant of causes. For people with opioid use disorders (OUDs), opioid stigma can lead to devastating consequences, including anxiety and depression. Still, mass media may stigmatize people with OUDs by ascribing stigmatizing labels (e.g., “opioid addict”) and other stigma features to those individuals. However, it is unclear how these stigmatizing messages influence public perceptions of people with OUDs and public support for rehabilitation and Naloxone administration policies. The model of stigma communication (MSC) provides a framework for understanding these relationships. This study used the MSC in two online factorial experiments, the first among college undergraduates ( $N = 231$ ) and the second among Amazon Mechanical Turk workers ( $N = 245$ ), to examine how stigmatizing messages about people with OUDs influence stigma-related outcomes. Results reveal that opioid stigma messages influence different outcomes depending on the content of those messages. Classification messages with a stigmatizing mark (e.g., “Alex appears unkempt”) and label (e.g., “opioid addict”) led to greater perceptions of dangerousness and threat in both studies. High stigma classification messages also led to an increased desire for behavioral regulation and social distance in Study 2. Structural equation modeling in Study 1 also supported the applicability of the MSC in the opioid context. Implications for health communication theory development and practice are discussed.

In 2017, the U.S. government declared the opioid crisis a national public health emergency (Davis, 2017). The number of deaths from opioid overdoses has skyrocketed in recent years, with a more than 500% increase and nearly 500,000 U.S. deaths between 1999 and 2019 (Centers for Disease Control and Prevention [CDC], 2021). Drug overdose is a leading cause of injury and death in the United States (CDC, 2020b). Even worse, drug overdose deaths peaked during the COVID-19 pandemic, marking the highest number of overdose deaths ever recorded in a single year and largely driven by an increase in synthetic opioid overdoses (CDC, 2020a). Opioid use disorders (OUDs) may involve a variety of opioids, including prescription opioids (e.g., oxycodone), heroin, and illicitly manufactured fentanyl. People with OUDs<sup>1</sup> experience “a problematic pattern of opioid use leading to problems or distress,” such as using an opioid longer than intended, failure to perform duties at work, and/or developing a tolerance to the opioid (American Psychiatric Association [APA], 2018). With pervasive rates of opioid overdoses and deaths, opioid overdose is a primary concern for people with OUDs and their family members, as well as health researchers, practitioners, and policymakers.

Opioid-related policies have been implemented to help curb opioid overdoses, but stigma toward individuals with OUDs inhibits these efforts and can harm affected individuals (Tsai et al., 2019). News articles about the opioid crisis have used

stigmatizing language to describe people with OUDs (e.g., “addict;” McGinty et al., 2019). Stigma scholars agree that terms like “addict” and “abuser” are stigmatizing and should thus *not* be used when studying stigma (e.g., Broyles et al., 2014). Experimental research confirms that these types of stigmatizing messages can lead to negative attitudes and biases toward people with OUDs (Ashford et al., 2018; Goodyear et al., 2018; Kelly & Westerhoff, 2010). Additional survey research suggests that people who have stigmatizing attitudes toward people with prescription OUDs have expressed more support for punitive public policies and less support for more public-health focused policies (Kennedy-Hendricks et al., 2017). Despite emerging evidence that opioid stigma has negative consequences, research has not elucidated the processes through which opioid stigma messages influence opioid-related outcomes.

This study uses the model of stigma communication (MSC; Smith, 2007; Smith et al., 2019) to study the influence of opioid stigma messages, presented in a hypothetical news article, on public perceptions of dangerousness and threat, social distance, behavioral regulation, stigma message sharing, and opioid-related policy support. By integrating policy support outcomes into the MSC and testing the model in a new context (opioids), this study advances stigma communication theory and offers practical recommendations to reduce opioid stigma and promote public health. Understanding the mechanisms through

which opioid messages impact attitudes and behavior can help researchers create more effective opioid stigma interventions.

## Opioid stigma and stigma messages

This manuscript investigates public stigma toward individuals with OUDs. Stigma is “an attribute that is deeply discrediting” (Goffman, 1963, p. 12). Smith (2007) elaborates that stigma is a “simplified, standardized image of the disgrace of a certain people that is held in common by the community at large” (p. 464). While Smith’s and Goffman’s definitions focus on the attribute/characteristic that leads people to categorize someone in a stigmatized group, other definitions also include the effects of possessing a stigmatizing attribute. For example, Link and Phelan (2001) specify stigma as a process wherein five components converge: (1) labeling, (2) stereotyping, (3) separation, (4) status loss and discrimination, and (5) social, economic, and political power structures. Despite differences, these definitions all uphold stigma as a negative belief or attitude toward a group with what society deems as a discrediting attribute.

There are also different stigma types, and this study is concerned with public stigma. Public stigma is enacted by stigmatizers upon individuals in the stigmatized group. Public stigma is related to, but distinct from, other types of stigma, such as macro-level stigma enacted within institutions and structures (*structural stigma*; Hatzenbuehler, 2016) and stigma experienced by people who are stigmatized (*internalized/self-stigma*; Corrigan & Rao, 2012). This study is concerned with public stigma and specifically with public stigma *messages* circulated by those outside of the stigmatized group. In line with Smith’s (2007) definition, we define these stigma messages as communication, both implicit and explicit, that contains one or more of the following: a mark (stigmatizing image), a label (stigmatizing, otherizing terminology), a message about personal responsibility for the stigmatizing attribute, or a message about the peril a stigmatized group poses to others. In centering the definition of stigma within the field of communication, we hope to promote a clearer understanding of the stigma construct.

Stigmatizing news coverage of opioids and people with OUDs ranges from blatant stigma messages to more subtle stigmatizing representations. For example, McGinty et al. (2019) found that approximately 49% of high circulation news articles from 2008 to 2018 used stigmatizing terms (e.g., “addict,” “abuser”) to describe people with OUDs. Dunne’s (2017) analysis of 2016 national opioid news coverage also found that many newspapers still used stigmatized representations of people with OUDs, such as “opioid abuser[s]” and “non-patient[s] who pilfers the medication from unsuspecting relatives,” or “finds a so-called candy man” (p. 32). News media platforms can be a conduit for stigmatizing information (e.g., Frankham, 2019), and as evidence of opioid stigma in the news media cumulates, understanding the impact of this stigma is an important aim. The MSC offers a framework for illuminating these relationships.

## The model of stigma communication (MSC)

The MSC explains the process and consequences dominant groups use to circulate public stigma messages about stigmatized

groups (Smith, 2007). These stigma messages lead people to appraise individuals in stigmatized groups as dangerous. In turn, appraising the group or person as dangerous results in “normal” groups keeping themselves distant from the stigmatized group, expressing a desire to regulate the group’s behavior, endorsing stigmatizing beliefs, and sharing the stigma message with others (Smith et al., 2019). The MSC uniquely centers the *message features* that communicate stigma, distinguishing it from other models of stigma, like the framework integrating normative influences on stigma (FINIS; Pescosolido et al., 2008) and the attribution model of stigma (Corrigan, 2006).

## Stigma message features

The MSC argues that four message features characterize stigma communication: marks, labels, responsibility/etiology, and peril (Smith, 2007; Smith et al., 2019). Stigma *marks* are communicated with cues that classify a person as part of a stigmatized group (Smith, 2007). Regardless of concealability, once a stigmatized attribute is exposed, non-stigmatized individuals affix a disgust-evoking cue – the mark – to the stigmatized group. In the case of readily apparent stigmas, a mark could be an infection or its symptoms (e.g., hives or a rash). Marks of more concealable stigmas still trigger disgust-laden images, just through a mental image rather than a physical one. For example, a stigma mark about HIV may cue someone to associate HIV with intravenous drug use.

The MSC’s second stigma message feature – the label – also works to classify groups as “other.” *Labels* ascribe terminology to members of the stigmatized group, reinforcing an “us versus them” mentality and reducing all members of a stigmatized group to one identity. For example, calling someone “a schizophrenic” enforces a stigma label, whereas talking about “someone with schizophrenia” avoids group-level labeling and stigma communication.

The final two stigma message features concern the enactment of consequences upon the stigmatized group. *Responsibility/etiology* messages assign choice and control to individuals in the stigmatized group (Smith, 2007; Smith et al., 2019). For example, individuals may stigmatize people with a higher body mass index (BMI) by sending messages that “they chose not to exercise and to gain weight.”

Finally, *peril* messages send a warning to non-stigmatized individuals that the stigmatized group poses some danger to “normal” society. Peril messages may use explicit danger appeals like “Warning!” or claim that physical harm can come from interacting with stigmatized individuals (Smith, 2007). Stigma peril messages may also be implicit or use coded language, especially for stigmatized conditions that are not contractible. For example, neurotypical college students have endorsed stigma peril messages about individuals with Autism Spectrum Disorders (ASD), claiming that their peers with ASD threatened the neurotypical students’ ability to function in the classroom. (Underhill et al., 2019).

This study uses the MSC’s (2007) conceptualizations of stigma message features but collapses the four categories into two theoretically relevant subsets: classification (marks and labels) and enactment (responsibility and peril). Various methods have been used to manipulate stigma message features.

While isolating the effects of each stigma message feature is advantageous, the typology of stigma message features in the MSC is not the only plausible categorization. For example, Smith et al. (2019) abandoned the strategy of manipulating all four features individually and collapsed them into a single message variable of high and low stigma messages. This study adopts a middle ground between these two methods, segmenting the four features into two smaller subsets that are still theoretically distinct. By doing so, this study attempts to explore ways that increase descriptive and logical simplicity (parsimony) and further develop communication theory.

### **Stigma-related outcomes**

Outside of the MSC, experimental research suggests that public opioid stigma messages can directly influence a variety of negative belief and attitudinal outcomes. Studies have found that stigmatizing descriptions of people with OUDs (e.g., “addict” as opposed to “person with a substance use disorder”) can lead to more negative affect toward those individuals (Goodyear et al., 2018), increased implicit bias (Ashford et al., 2018), greater attributions of responsibility (Kelly & Westerhoff, 2010), and increased desire for punitive action (Kelly & Westerhoff, 2010). Together, literature suggests that stigmatizing messages about people with OUDs can directly influence stigma-related outcomes. Thus, the present study first investigates whether stigma message features will exert direct effects on stigma-related outcomes before exploring the possibility of a mediated model of stigma message effects postulated by the MSC (Smith et al., 2019).

Presently, the MSC has explored four outcomes of stigma messages: social distance, stigma message sharing, behavioral regulation, and stigma beliefs (Smith et al., 2019).

### **Social distance**

Little MSC research has investigated the direct influence of stigma message features on social distance – a person’s desired closeness to the stigmatized group. In the most recent MSC investigation, Smith et al. (2019) found that stigma messages significantly and indirectly influenced social distance through danger appraisal, and the MSC explained 62% of the total variance in social distance. Despite this clear connection between stigma messages and social distance, neither research on the MSC or opioid-related stigma has illuminated which specific stigma message features (as opposed to stigma messages more broadly) influence social distance. Given the promise of Smith et al.’s (2019) study and the fact that social distance is extensively studied in stigma research and often a target of stigma interventions (e.g., Yang & Link, 2015), we expect that:

**H1:** High stigma (a) classification messages, including a mark and a label, and (b) enactment messages, including responsibility and peril messages, will lead to greater desired social distance than low stigma classification and enactment messages.

### **Stigma message sharing**

Some MSC research suggests that stigma message features can directly influence stigma message sharing, or the likelihood that a person will share the stigma message with their social network. For example, Smith (2012) found that the presence of a stigma mark significantly increased stigma message sharing compared to the no marking condition. Alternatively, Smith (2014) found no evidence that any of the four MSC features predicted stigma message sharing. Smith et al. (2019) later found that stigma messages indirectly affected stigma message sharing through three mediators. Though the empirical research is not conclusive, it seems likely that stigma message features could directly lead to stigma message sharing because this sharing would help individuals in the non-stigmatized group distinguish themselves from the stigmatized “other” and protect their group identity (Smith, 2007). As such, we expect that:

**H2:** High stigma (a) classification and (b) enactment messages will lead to greater stigma message sharing intentions than low stigma classification and enactment messages.

### **Behavioral regulation**

Behavioral regulation, the desired isolation and intervention of the stigmatized group, has been more consistently predicted by stigma message features than social distance and stigma message sharing. Both peril (Smith, 2012) and responsibility (Smith, 2012) messages have significantly and directly predicted behavioral regulation. As such, we anticipate that:

**H3:** High stigma (a) classification and (b) enactment messages will lead to a greater desire for behavioral regulation than low stigma classification and enactment messages.

**Opioid-related behavioral regulation and policy support.** Two prominent strategies being used to curb the opioid epidemic are rehabilitation programs and the life-saving opioid overdose-response drug, Naloxone/Narcan (Carroll et al., 2018). These rehabilitation policies and programs may vary from therapeutic to medication-assisted treatment programs to a combination of both types (National Institute on Drug Abuse, 2019).

Research outside of the MSC suggests that behavioral regulation may uniquely manifest in how individuals express support for opioid-related public policies involving Naloxone administration and rehabilitation. In an experimental study, Kelly and Westerhoff (2010) found that participants exposed to the stigmatizing condition (“substance abuser”) endorsed greater responsibility attributions and desired more punitive action against individuals than participants exposed to the less stigmatizing condition (“person with a substance use disorder”). Having an OUD is intricately tied to public perceptions of criminalization (Buchman et al., 2017; McGinty et al., 2015), which may explain why Kennedy-Hendricks et al. (2017) found a negative correlation between public opioid stigma and support for substance use treatment policies. While no research has explicitly linked stigma messages to support for Naloxone

administration policies, research points to the likelihood of this relationship. As such, it is reasonable to expect that:

**H4:** High stigma (a) classification and (b) enactment messages will lead to less support for rehabilitation policies than low stigma classification and enactment messages.

**H5:** High stigma (a) classification and (b) enactment messages will lead to less support for Naloxone administration policies than low stigma classification and enactment messages.

### **Stigma-related mediators**

The most recent MSC considers three mediators: danger appraisal, shock, and common ground (Smith et al., 2019). First, danger appraisal is a second-order mediator comprised of two variables: perceptions of the stigmatized group as dangerous and as personally threatening to an individual's well-being. Because early work on the MSC found evidence that stigma messages directly led to greater perceived dangerousness (Smith, 2012, 2014), the revised MSC positions danger appraisal as a mediator between stigma messages and behavioral regulation, social distance, and stigma message sharing. The inability of the MSC to consistently predict stigma message sharing also led Smith et al. (2019) to explore two new mediators – shock and common ground – between danger appraisal and stigma message sharing.

### **Danger appraisal**

Across MSC studies, danger appraisal has been significantly predicted by stigma message features and significantly associated with stigma-related outcomes. Smith et al. (2019) found significant relationships between danger appraisal and all three outcomes of interest: social distance, stigma message sharing, and behavioral regulation. Smith also found that perceived dangerousness was positively associated with behavioral regulation (2012, 2014), and stigma message sharing (2014). It is also worth noting that perceived dangerousness has been positively correlated with stigma beliefs (Smith, 2012), an outcome often explored in MSC research. However, for the opioid context, stigma beliefs are about perceived dangerousness and threat (e.g., Palamar et al., 2011). In other words, danger appraisal is a mediator composed of these stigma beliefs rather than a variable that predicts them. Thus, this study mirrors Smith et al.'s (2019) conceptualization of the MSC, excluding stigma beliefs. Given clear connections between stigma message features, danger appraisal, and stigma-related outcomes, we hypothesize that:

**H6:** High (a) classification and (b) enactment messages will lead to greater danger appraisal, including perceived dangerousness and threat, than low classification and enactment messages.

**H7:** Danger appraisal will be positively associated with (a) social distance and (b) behavioral regulation and negatively associated with support for (c) rehabilitation policies and (d) Naloxone administration policies.

### **Shock value**

Shock value, defined as a combination of surprise and extremity, may also explain the relationship between danger appraisal and stigma message sharing. When people appraise an individual as dangerous, they may experience shock and subsequently want to share shocking information with others (Kim, 2015; Smith et al., 2019). Only one MSC study examined the role of shock and common ground in predicting stigma message sharing (Smith et al., 2019). Thus, researchers need to validate these mediators and comment on their applicability in new contexts, such as opioids. Given theoretical and empirical evidence, we expect that:

**H8 (a):** Danger appraisal will be positively associated with shock value, and

**H8 (b):** Shock value will be positively associated with stigma message sharing.

### **Common ground**

Common ground, defined as common interest among people, may also partially explain the relationship between danger appraisal and stigma message sharing. People are motivated to share information on common interests, including stigma messages, to foster social bonding with others (Berger, 2014). Similarly, appraising the stigmatized group as dangerous can also offer shared emotional experience for members of the non-stigmatized group and promote ingroup inclusion (Berger, 2014; Smith et al., 2019). As such, we expect that:

**H9 (a):** Danger appraisal will be positively associated with common ground, and

**H9 (b):** Common ground will be positively associated with stigma message sharing.

### **The MSC for opioid-related stigma**

While also examining the previously hypothesized direct effects and associations, another aim of this study is to test the viability of the MSC (Smith et al., 2019) revised to fit the opioid context. As such, we hypothesize that the current model will be a good fit for the data (Figure 1).

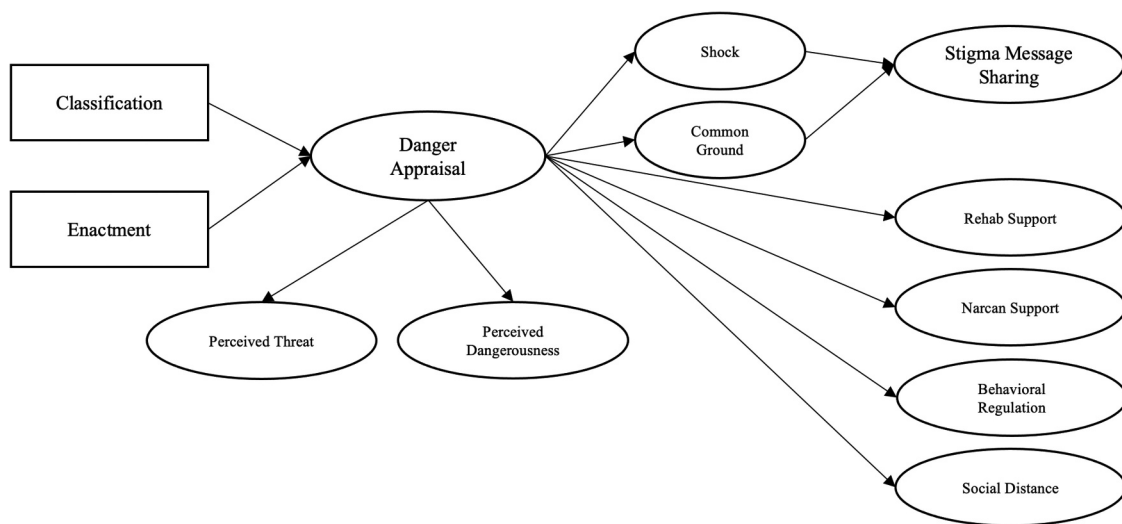
### **Study 1**

Researchers conducted two conceptually equivalent experiments. Study 1 tested key hypotheses among undergraduate students, and Study 2 sought to replicate these findings among a more diverse adult population. Unless otherwise noted, Study 1 and Study 2 utilized the same procedures, stimuli, and measures.

### **Method**

#### **Participants**

An online study was conducted using an undergraduate student participant pool at a Mid-Atlantic University. After



**Figure 1.** Hypothesized model of MSC in the opioid context. The current stigma conceptualization considers two stigma message factors (classification and enactment) but does not hypothesize interactions between the two factors because theoretically, there is no reason to expect a moderated relationship.

eliminating incomplete responses and participants who failed the attention check questions ( $n = 34$ ), 231 responses were included in the final sample. On average, participants were 19 years old ( $SD = 1.20$ ). Most participants were women ( $n = 138$ , 59.7%) and college freshman ( $n = 151$ , 65.4%). The majority of the sample was also white ( $n = 150$ , 68.4%), followed by 18.6% Asian ( $n = 43$ ), 10.8% African American ( $n = 25$ ), 6.1% Latinx ( $n = 14$ ), 3% Middle Eastern ( $n = 7$ ), 0.90% Native Hawaiian/Pacific Islander ( $n = 2$ ) and 0.40% American Indian or Alaska Native ( $n = 1$ ).

### Procedures

With Institutional Review Board (IRB) approval from the University of Maryland, College Park,<sup>2</sup> participants completed an online experimental survey where they were randomly assigned to one of the four experimental conditions in the 2 (classification: high, low)  $\times$  2 (enactment: high, low) between-subjects factorial experiment. In each condition, participants were exposed to a hypothetical news article about a person with an OUD (Appendix A). After reading the article, participants responded to a series of attention and manipulation checks as well as key study measures and demographic questions. Finally, participants

were debriefed, told that the story was fictional, and given a phone number to the National Substance Abuse Treatment Helpline.

### Experimental stimuli

Experimental stimuli were developed in line with the MSC's (2007) conceptualizations and operationalized for the opioid context (see Table 1 and Appendix A).

### Measures

Unless otherwise noted, all items were measured on 7-point Likert scales where 1 was equal to "Strongly Disagree," and 7 was equal to "Strongly Agree." Negatively worded items were reverse coded for scale reliability. Example items are included with each measure.<sup>3</sup>

**Perceived dangerousness.** Perceived dangerousness was measured using a modified version of Smith's (2012, 2014) scale. Three items assessed the extent to which participants viewed the person in the news story as a danger to others ( $\alpha = .79$ ,  $M = 4.03$ ,  $SD = 1.02$ ). The scale included items like: "I think Alex is a danger to others."

**Table 1.** Stigma message features manipulated in this study: classification & enactment.

| Manipulation   | Model of Stigma Communication Features | Explanations                                                         | Examples                                                                                              | Examples Used in Manipulations                                                                      |
|----------------|----------------------------------------|----------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Classification | Marks                                  | Cues that classify a person as part of a stigmatized group           | An infection or its symptoms (e.g., hives or a rash)                                                  | Alex's "tarnished clothes," Alex appears "unkempt"                                                  |
|                | Labels                                 | Group-level terminology designed to dehumanize the stigmatized group | Calling someone "a schizophrenic"                                                                     | "opioid addicts"                                                                                    |
| Enactment      | Responsibility                         | Choice and control assigned to stigmatized group                     | "Obese people chose not to exercise and to gain weight."                                              | "Alex made the choice to take opioids and continue using them"                                      |
|                | Peril                                  | Perceived danger that stigmatized group poses to others and society  | Neurotypical students may think students with Autism Spectrum Disorders (ASD) threaten their learning | "If Alex continues on this path, there may be consequences for friends, family, and our community." |

Smith (2007), Smith et al. (2019), and Underhill et al. (2019).

**Perceived threat.** Perceived threat was measured using a modified version of Smith et al.'s (2019) scale. Three items assessed the extent to which participants viewed the person in the news story as personally concerning to their wellbeing ( $\alpha = .88$ ,  $M = 3.44$ ,  $SD = 1.35$ ). The scale included items like: "Alex is a threat to my safety."

**Common ground.** Common ground was measured using Smith et al.'s (2019) scale. Three items assessed the degree to which participants thought the topic was relevant to others ( $\alpha = .79$ ,  $M = 4.63$ ,  $SD = 1.63$ ). The scale included items like: "The message is something that everyone can talk about."

**Message shock value.** Message shock value was measured using Smith et al.'s (2019) scale. Three items assessed the degree to which participants found the message shocking ( $\alpha = .84$ ,  $M = 3.78$ ,  $SD = 1.41$ ). The scale included items like: "The message in the article surprised me."

**Stigma message sharing.** Stigma message sharing was measured using a modified version of Smith's (2014) scale. Five items assessed the likelihood that participants would share the message with relational others. Response options ranged from "Extremely Unlikely" (1) to "Extremely Likely" (7) ( $\alpha = .93$ ,  $M = 3.57$ ,  $SD = 1.63$ ). The scale included items like: "What is the likelihood that you would share this message with other people?"

**Social distance.** Social distance was measured using a modified version of the Bogardus (1933) Social Distance Scale (Gillespie-Lynch et al., 2015). Three items assessed participants' desire to be close to the person in the news article, and a higher response indicated *less* desired social distance. Response options ranged from "Definitely Unwilling" (1) to "Definitely Willing" (7) ( $\alpha = .86$ ,  $M = 2.93$ ,  $SD = 1.15$ ). The scale included items like: "How willing would you be to move next door to Alex?"

**Behavioral regulation.** Behavioral regulation, often called intervention or regulation support, was measured using a modified version of Smith's (2012, 2014) scale. Three items assessed the degree to which participants desired regulation of the person's behavior in public spaces ( $\alpha = .86$ ,  $M = 3.83$ ,  $SD = 1.35$ ). The scale included items like: "I would want Alex's movements throughout the community to be monitored and reduced."

**Support for rehabilitation programs (vs. jail).** Support for rehabilitation programs was assessed by the degree to which participants thought the person in the article should be treated with rehabilitation as opposed to jail time. Three items assessed support for rehabilitation programs ( $\alpha = .75$ ,  $M = 6.13$ ,  $SD = 0.89$ ). The scale included items like: "Alex should have the opportunity to go to rehab."

**Support for Naloxone/Narcan administration.** Support for Naloxone/Narcan administration was assessed by the degree to which individuals believed that Narcan should be used in an overdose situation. Prior to answering the three items,

participants were informed about what Naloxone/Narcan was ( $\alpha = .83$ ,  $M = 5.68$ ,  $SD = 1.17$ ). The scale included items like: "Using Narcan to save Alex's life is the right choice."

### Manipulation checks

To check the classification manipulation, participants responded to a measure with six Likert-response items, including: "If I saw Alex in public, I would think he was an addict" and "Alex is an addict." Results of an independent samples *t*-test revealed that participants in the high classification condition expressed greater marking and labeling stigma ( $M_{High} = 4.70$ ) than participants in the low classification condition ( $M_{Low} = 3.98$ ) ( $t(229) = -7.34$ ,  $p < .01$ ).

Next, participants responded to an enactment measure composed of six Likert-response items, including items such as: "Alex is responsible for being addicted to opioids" and "Alex's friends and family also suffer the consequences of opioid misuse." Results of an independent samples *t*-test revealed that participants in the high enactment condition expressed greater responsibility and peril stigma ( $M_{High} = 4.87$ ) than participants in the low enactment condition ( $M_{Low} = 4.65$ ) ( $t(229) = -2.409$ ,  $p < .05$ ).

### Analysis

First, we used *t*-tests to examine the direct impacts of experimental manipulations on mediators and outcome variables, and then we used two-step Structural Equation Modeling (SEM) through MPlus to examine the mechanisms of the stigma message effects process. In the two-step SEM process, the measurement model was first specified, allowing all latent variables to covary and specifying danger appraisal as a second-order factor composed of perceived dangerousness and perceived threat. The measurement model fit was fairly satisfactory, and no modification indices provided theoretically justifiable modifications. As such, the initial measurement model was retained as the final measurement model (*Satorra-Bentler adjusted*  $\chi^2_{df=347} = 606.084$ ,  $\chi^2/df$  ratio = 1.75, *RMSEA* = .057, 90% CI [.049, .064],  $p = .07$ , *CFI* = .930, *SRMR* = .071). Based on recommendations from Hu and Bentler (1999), the *SRMR* index revealed good model fit ( $<.08$ ) as did the Chi-Square to degrees of freedom ratio ( $<2$ ), a less stringent model fit test than the typical Chi-Square model fit index (Schreiber et al., 2006).

Next, the structural model was specified according to Figure 1. Classification and Enactment were each coded as 0 (low) and 1 (high). Danger appraisal was hypothesized as a complete mediator, as were shock and common ground. Classification and Enactment were allowed to covary with one another, and all dependent variables were allowed to covary.

### Results

#### *T*-Tests of stigma message features on stigma-related outcomes

A series of *t*-tests were conducted to examine the impacts of experimental manipulations on mediators and outcome

variables and test hypotheses 1 through 6. Participants in the low classification conditions demonstrated significantly lower perceived threat ( $M_{Low} = 3.08$ ,  $SD_{Low} = 1.22$ ,  $M_{High} = 3.89$ ,  $SD_{High} = 1.36$ ) ( $t(229) = -4.787$ ,  $p < .001$ ) and less perceived dangerousness ( $M_{Low} = 3.90$ ,  $SD_{Low} = 1.01$ ,  $M_{High} = 4.18$ ,  $SD_{High} = 1.01$ ) ( $t(229) = -2.04$ ,  $p < .05$ ) compared to the high classification group. However, there were no significant differences between high and low classification groups across all other variables (Table 2). Therefore, only hypothesis 6a was supported, but there was no support for hypotheses 1a, 2a, 3a, 4a, or 5a.

On the other hand, the participants in the low enactment group demonstrated close-to-significantly higher support for rehabilitation ( $M_{Low} = 6.24$ ,  $SD_{Low} = 0.81$ ,  $M_{High} = 6.01$ ,  $SD_{High} = 0.95$ ) ( $t(229) = 1.964$ ,  $p = .051$ ) and significantly less desire for social distance ( $M_{Low} = 3.09$ ,  $SD_{Low} = 1.14$ ,  $M_{High} = 2.76$ ,  $SD_{High} = 1.12$ ) ( $t(229) = 2.197$ ,  $p < .05$ ) than the high enactment group. However, there were no significant differences between high and low enactment groups across all other dependent variables (Table 3). Therefore, only hypothesis 1b was supported, but there was no support for hypotheses 2b, 3b, 4b, 5b, or 6b.

**Table 2.** Study 1 classification stigma *t*-test results.

|                         | Classification | N   | M    | SD   | SE   | t         | df    |
|-------------------------|----------------|-----|------|------|------|-----------|-------|
| Perceived Threat        | Low            | 128 | 3.08 | 1.22 | 0.10 | -4.787*** | 229   |
|                         | High           | 103 | 3.89 | 1.36 | 0.13 |           |       |
| Perceived Dangerousness | Low            | 128 | 3.90 | 1.01 | 0.08 | -2.04*    | 229   |
|                         | High           | 103 | 4.18 | 1.01 | 0.10 |           |       |
| Shock                   | Low            | 128 | 3.89 | 1.46 | 0.12 | 1.519     | 229   |
|                         | High           | 103 | 3.61 | 1.34 | 0.13 |           |       |
| Common Ground           | Low            | 128 | 4.75 | 1.17 | 0.10 | 1.645     | 229   |
|                         | High           | 103 | 4.48 | 1.29 | 0.12 |           |       |
| Stigma Message Sharing  | Low            | 128 | 3.63 | 1.67 | 0.14 | 0.749     | 229   |
|                         | High           | 103 | 3.47 | 1.56 | 0.15 |           |       |
| Support for Rehab       | Low            | 128 | 6.15 | 0.80 | 0.07 | 0.478     | 229   |
|                         | High           | 103 | 6.09 | 0.98 | 0.09 |           |       |
| Support for Narcan      | Low            | 128 | 5.64 | 1.13 | 0.09 | -0.529    | 229   |
|                         | High           | 103 | 5.72 | 1.23 | 0.12 |           |       |
| Behavioral Regulation   | Low            | 128 | 3.74 | 1.31 | 0.11 | -1.079    | 229   |
|                         | High           | 103 | 3.94 | 1.48 | 0.14 |           |       |
| Social Distance         | Low            | 128 | 2.92 | 1.03 | 0.09 | -0.105    | 195.8 |
|                         | High           | 103 | 2.93 | 1.27 | 0.12 |           |       |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 3.** Study 1 enactment stigma *t*-test results.

|                         | Enactment | N   | M    | SD   | SE   | t      | df  |
|-------------------------|-----------|-----|------|------|------|--------|-----|
| Perceived Threat        | Low       | 115 | 3.31 | 1.38 | 0.12 | -1.414 | 229 |
|                         | High      | 116 | 3.56 | 1.30 | 0.12 |        |     |
| Perceived Dangerousness | Low       | 115 | 3.94 | 1.06 | 0.09 | -1.246 | 229 |
|                         | High      | 116 | 4.11 | 0.98 | 0.09 |        |     |
| Shock                   | Low       | 115 | 3.81 | 1.37 | 0.12 | 0.485  | 229 |
|                         | High      | 116 | 3.72 | 1.45 | 0.13 |        |     |
| Common Ground           | Low       | 115 | 4.61 | 1.24 | 0.11 | -0.232 | 229 |
|                         | High      | 116 | 4.64 | 1.23 | 0.11 |        |     |
| Stigma message sharing  | Low       | 115 | 3.52 | 1.71 | 0.15 | -0.405 | 229 |
|                         | High      | 116 | 3.61 | 1.54 | 0.14 |        |     |
| Support for Rehab       | Low       | 115 | 6.24 | 0.81 | 0.07 | 1.964  | 229 |
|                         | High      | 116 | 6.01 | 0.95 | 0.08 |        |     |
| Support for Narcan      | Low       | 115 | 5.72 | 1.17 | 0.10 | 0.579  | 229 |
|                         | High      | 116 | 5.63 | 1.17 | 0.10 |        |     |
| Behavioral Regulation   | Low       | 115 | 3.75 | 1.48 | 0.13 | -0.776 | 229 |
|                         | High      | 116 | 3.90 | 1.31 | 0.12 |        |     |
| Social Distance         | Low       | 115 | 3.09 | 1.14 | 0.10 | 2.197* | 229 |
|                         | High      | 116 | 2.76 | 1.12 | 0.10 |        |     |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

## Model testing

After examining the direct impacts of manipulations on study variables, we used SEM to better understand the mediation mechanisms at play in the stigma process. All model hypotheses were examined by inspecting the fit of the final structural model specified during analysis and then interpreting path coefficients. The final structural model demonstrated relatively satisfactory model fit (Satorra-Bentler adjusted  $\chi^2_{df=411} = 763.839$ ,  $\chi^2/df$  ratio = 1.86, RMSEA = .059, 90% CI [.052, .065],  $p = .02$ , CFI = .915, SRMR = .082). Based on recommendations from Hu and Bentler (1999), the SRMR index approached the index of good model fit (<.08), and the Chi-Square to degrees of freedom ratio was satisfactory (<2) (Schreiber et al., 2006).

Results are pictured in Figure 2, and all paths were significant and in the expected direction except the one concerning the relationship between danger appraisal and common ground. The model, as well as hypotheses 7a, 7b, 7c, 7d, 8a, 8b, and 9b were supported. There was no support for hypothesis 9a.

**Tests of indirect effects.** Mediation analyses using bootstrapping (1,000 samples) were also conducted to determine the indirect effects of stigma message features on outcomes. Three indirect effects were significant through danger appraisal: the indirect effects of the classification message on behavioral regulation, classification on social distance, and classification on support for Naloxone administration. No other indirect effects were significant (Table 4).

## Study 2

Study 2 was conducted to provide a conceptual replication of Study 1 among a more diverse sample. For the few variables listed below, different measurements were employed because we believed these modified measures might more wholly reflect the constructs. Experimental stimuli and study procedures were the same as Study 1.

## Method

### Participants

With the same IRB approval, an online study was conducted using Amazon Mechanical Turk (MTurk) workers. After eliminating incomplete responses and participants who failed the attention check questions ( $n = 24$ ), 245 responses were included in the final sample. Participants were compensated 2 U.S. dollars to complete the 20-minute online survey. On average, participants were 35.85 years old ( $SD = 10.75$ ). Most participants were men ( $n = 146$ , 59.6%) and were white ( $n = 193$ , 78.8%).

### Measures

Most measures remained the same in Study 2, but a few variables were measured with item additions and/or revisions: *common ground* ( $\alpha = .80$ ,  $M = 5.39$ ,  $SD = 0.96$ ), *stigma message sharing* (modified from Lee & Jin, 2019;  $\alpha = .92$ ,  $M = 3.65$ ,  $SD = 1.66$ ), *support for Naloxone/Narcan administration* ( $\alpha = .922$ ,  $M = 5.87$ ,  $SD = 1.18$ ), and *support for rehabilitation*.

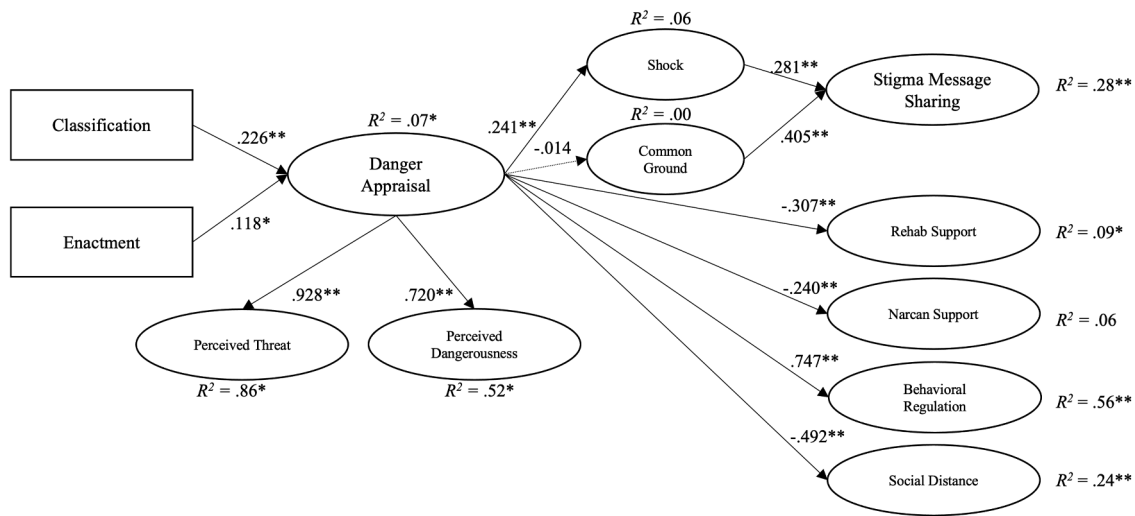


Figure 2. Study 1 latent path model (structural model), \* $p < .05$ , \*\* $p < .01$ .

Table 4. Study 1 indirect effects.

| From           | To                     | Estimate | S.E.  | Est./S.E. |
|----------------|------------------------|----------|-------|-----------|
| Classification | Behavioral Regulation  | 0.169**  | 0.06  | 2.81      |
| Enactment      | Behavioral Regulation  | 0.088    | 0.06  | 1.466     |
| Classification | Social Distance        | -0.111** | 0.042 | -2.654    |
| Enactment      | Social Distance        | -0.058   | 0.044 | -1.31     |
| Classification | Support for Rehab      | -0.069   | 0.037 | -1.866    |
| Enactment      | Support for Rehab      | -0.036   | 0.03  | -1.206    |
| Classification | Support for Narcan     | -0.054*  | 0.028 | -1.97     |
| Enactment      | Support for Narcan     | -0.028   | 0.02  | -1.418    |
| Classification | Stigma Message Sharing | 0.014    | 0.013 | 1.045     |
| Enactment      | Stigma Message Sharing | 0.007    | 0.009 | 0.837     |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Support for rehabilitation was separated into two separate scales to more appropriately reflect two types of rehabilitation, including support for rehabilitation (medication assisted treatment) ( $\alpha = .77$ ,  $M = 5.60$ ,  $SD = 1.19$ ) and support for rehabilitation (behavioral therapy only) ( $\alpha = .78$ ,  $M = 5.02$ ,  $SD = 1.30$ ).

### Manipulation checks

To check the classification manipulation in Study 2, participants responded to two questions: "On a scale of 0–100, with 0 being not at all and 100 being definitely, how much do you think Alex looks like an addict?", and "On a scale of 0–100, with 0 being least likely and 100 being most likely, how likely would you be willing to call Alex an "addict?." Two independent samples  $t$ -tests verified the manipulation's success. In response to the first question, participants in the high classification condition expressed greater marking stigma ( $M_{High} = 70.55$ ,  $SD_{High} = 27.17$ ) than participants in the low classification condition ( $M_{Low} = 28.48$ ,  $SD_{Low} = 30.41$ ) ( $t(243) = -11.42$ ,  $p < .01$ ). In response to the second question, participants in the high classification condition expressed greater labeling stigma ( $M_{High} = 87.27$ ,  $SD_{High} = 22.91$ ) than participants in the low classification condition ( $M_{Low} = 78.40$ ,  $SD_{Low} = 27.92$ ) ( $t(243) = -2.72$ ,  $p < .01$ ).

The enactment manipulation was also assessed through two questions: "On a scale of 0–100, with 0 being the least responsible and 100 being the most responsible, how responsible is Alex for Alex's opioid use?", and "On a scale of 0–100 with 0 being no effect and 100 being the most effect, how much do

Alex's actions affect others?" No significant differences were found between high enactment ( $M_{High} = 70.83$ ) and low enactment ( $M_{Low} = 65.67$ ) groups for responsibility stigma ( $t(243) = -1.30$ ,  $p = .20$ ), nor between high enactment ( $M_{High} = 69.07$ ) and low enactment ( $M_{Low} = 62.49$ ) groups for peril stigma ( $t(243) = -1.88$ ,  $p = .06$ ). Implications of this failed manipulation check are explored in the discussion section.

### Analysis

The same analytical strategy from Study 1 was replicated. The initial measurement model indicated relatively satisfactory fit and was retained as the final measurement model: (Satorra Bentler  $\chi^2_{df=556} = 1003.789$ ,  $p < .001$ ,  $\chi^2/df$  ratio = 1.805, RMSEA = .057 90% CI [.052, .063], CFI = .909, SRMR = .071). The SRMR index revealed good model fit ( $< .08$ ) as did the Chi-Square to degrees of freedom ratio ( $< 2$ ) (Hu & Bentler, 1999; Schreiber et al., 2006).

Next, the structural model was again specified according to Figure 1, with the addition of a second latent variable measuring support for rehabilitation policy (Figure 3). All model specifications from Study 1 were retained.

### Results

#### T-Tests of stigma message features on stigma-related outcomes

Again, a series of  $t$ -tests were first conducted to examine the impacts of experimental manipulations on mediators and outcome variables and test hypotheses 1 through 6. Participants in the low classification condition reported significantly less desire for social distance ( $M_{Low} = 3.60$ ,  $SD_{Low} = 1.60$ ,  $M_{High} = 3.11$ ,  $SD_{High} = 1.46$ ) ( $t(243) = 2.528$ ,  $p < .05$ ), lower behavioral regulation ( $M_{Low} = 3.50$ ,  $SD_{Low} = 1.60$ ,  $M_{High} = 4.02$ ,  $SD_{High} = 1.54$ ) ( $t(243) = -2.604$ ,  $p < .05$ ), lower perceived threat ( $M_{Low} = 3.80$ ,  $SD_{Low} = 1.41$ ,  $M_{High} = 4.18$ ,  $SD_{High} = 1.23$ ) ( $t(243) = -2.2$ ,  $p < .05$ ), and lower perceived dangerousness ( $M_{Low} = 3.31$ ,  $SD_{Low} = 1.70$ ,  $M_{High} = 3.94$ ,  $SD_{High} = 1.43$ ) ( $t(235.721) = -3.117$ ,  $p < .01$ ) than high classification groups.

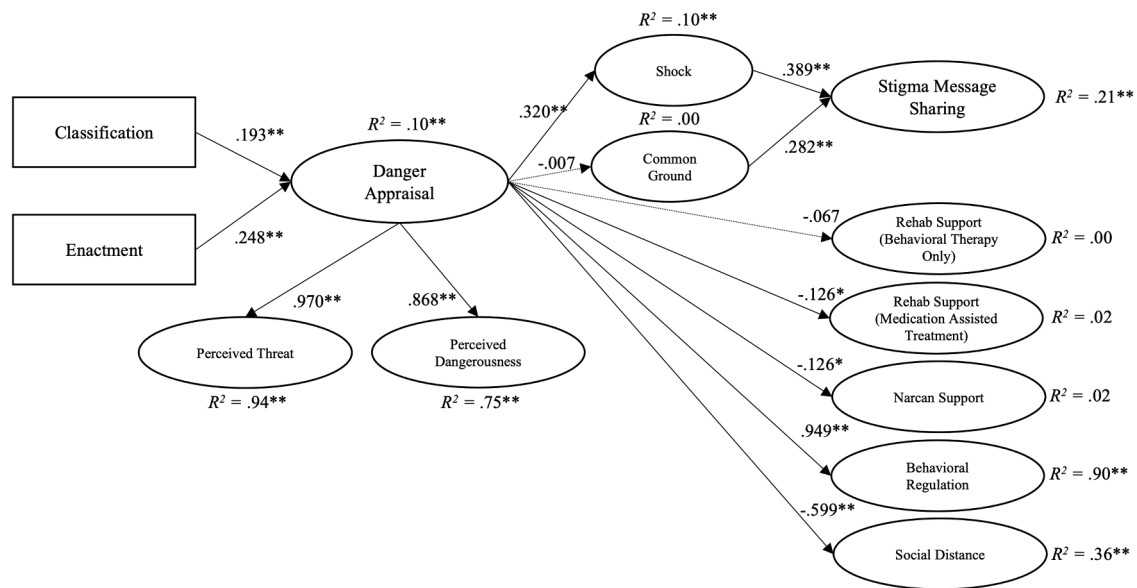


Figure 3. Study 2 latent path model (structural model), \* $p < .05$ , \*\* $p < .01$ .

There were no significant differences across other variables. Therefore, hypotheses 1a, 3a, and 6a were supported, but not 2a, 4a, or 5a (Table 5).

On the other hand, participants in the low enactment condition reported close-to-significantly lower behavioral regulation ( $M_{Low} = 3.57$ ,  $SD_{Low} = 1.48$ ,  $M_{High} = 3.96$ ,  $SD_{High} = 1.67$ ) ( $t(243) = -1.942$ ,  $p = .053$ ), significantly greater support for rehabilitation (behavioral therapy only) ( $M_{Low} = 5.19$ ,  $SD_{Low} = 1.23$ ,  $M_{High} = 4.84$ ,  $SD_{High} = 1.36$ ) ( $t(243) = 2.141$ ,  $p < .05$ ), lower perceived threat ( $M_{Low} = 3.66$ ,  $SD_{Low} = 1.28$ ,  $M_{High} = 4.33$ ,  $SD_{High} = 1.31$ ) ( $t(243) = -4.037$ ,  $p < .001$ ), and lower perceived dangerousness ( $M_{Low} = 3.25$ ,  $SD_{Low} = 1.45$ ,  $M_{High} = 4.03$ ,  $SD_{High} = 1.66$ ) ( $t(236.006) = -3.899$ ,  $p < .001$ ) compared to the high enactment condition. There were no significant differences between high and low enactment groups across other variables. Hypotheses 6b was supported, with partial

Table 6. Study 2 enactment t-test results.

|                                     | Enactment | N   | M    | SD   | SE   | t         | df      |
|-------------------------------------|-----------|-----|------|------|------|-----------|---------|
| Perceived Threat                    | Low       | 125 | 3.66 | 1.28 | 0.11 | -4.037*** | 243     |
|                                     | High      | 120 | 4.33 | 1.31 | 0.11 |           |         |
| Perceived Dangerousness             | Low       | 125 | 3.25 | 1.45 | 0.13 | -3.899*** | 236.006 |
|                                     | High      | 120 | 4.03 | 1.66 | 0.15 |           |         |
| Shock                               | Low       | 125 | 3.34 | 1.47 | 0.13 | -0.06     | 243     |
|                                     | High      | 120 | 3.35 | 1.58 | 0.14 |           |         |
| Common Ground                       | Low       | 125 | 5.53 | 0.87 | 0.07 | 1.292     | 243     |
|                                     | High      | 120 | 5.38 | 0.97 | 0.08 |           |         |
| Stigma message sharing              | Low       | 125 | 3.72 | 1.53 | 0.13 | 0.714     | 233.545 |
|                                     | High      | 120 | 3.57 | 1.80 | 0.16 |           |         |
| Support for Rehab (MAT)             | Low       | 125 | 5.52 | 1.19 | 0.10 | -0.984    | 243     |
|                                     | High      | 120 | 5.67 | 1.18 | 0.10 |           |         |
| Support for Rehab (Behavioral only) | Low       | 125 | 5.19 | 1.23 | 0.11 | 2.141*    | 243     |
|                                     | High      | 120 | 4.84 | 1.36 | 0.12 |           |         |
| Support for Narcan                  | Low       | 125 | 5.90 | 1.19 | 0.10 | 0.322     | 242.63  |
|                                     | High      | 120 | 5.85 | 1.18 | 0.10 |           |         |
| Behavioral Regulation               | Low       | 125 | 3.57 | 1.48 | 0.13 | -1.942    | 243     |
|                                     | High      | 120 | 3.96 | 1.67 | 0.15 |           |         |
| Social Distance                     | Low       | 125 | 3.51 | 1.47 | 0.13 | 1.614     | 243     |
|                                     | High      | 120 | 3.19 | 1.62 | 0.14 |           |         |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

Table 5. Study 2 classification t-test results.

|                                     | Classification | N   | M    | SD   | SE   | t        | df      |
|-------------------------------------|----------------|-----|------|------|------|----------|---------|
| Perceived Threat                    | Low            | 122 | 3.80 | 1.41 | 0.12 | -2.2*    | 243     |
|                                     | High           | 123 | 4.18 | 1.23 | 0.11 |          |         |
| Perceived Dangerousness             | Low            | 122 | 3.31 | 1.70 | 0.15 | -3.117** | 235.721 |
|                                     | High           | 123 | 3.94 | 1.43 | 0.12 |          |         |
| Shock                               | Low            | 122 | 3.29 | 1.57 | 0.14 | -0.612   | 243     |
|                                     | High           | 123 | 3.41 | 1.48 | 0.13 |          |         |
| Common Ground                       | Low            | 122 | 5.51 | 0.88 | 0.08 | 0.957    | 243     |
|                                     | High           | 123 | 5.40 | 0.96 | 0.08 |          |         |
| Stigma message sharing              | Low            | 122 | 3.57 | 1.56 | 0.14 | -0.74    | 240.159 |
|                                     | High           | 123 | 3.73 | 1.76 | 0.15 |          |         |
| Support for Rehab (MAT)             | Low            | 122 | 5.54 | 1.18 | 0.10 | -0.79    | 243     |
|                                     | High           | 123 | 5.66 | 1.19 | 0.10 |          |         |
| Support for Rehab (Behavioral only) | Low            | 122 | 4.97 | 1.28 | 0.11 | -0.6     | 243     |
|                                     | High           | 123 | 5.07 | 1.33 | 0.12 |          |         |
| Support for Narcan                  | Low            | 122 | 5.87 | 1.27 | 0.11 | -0.082   | 237.977 |
|                                     | High           | 123 | 5.88 | 1.10 | 0.09 |          |         |
| Behavioral Regulation               | Low            | 122 | 3.50 | 1.60 | 0.14 | -2.604*  | 243     |
|                                     | High           | 123 | 4.02 | 1.54 | 0.13 |          |         |
| Social Distance                     | Low            | 122 | 3.60 | 1.60 | 0.14 | 2.528*   | 243     |
|                                     | High           | 123 | 3.11 | 1.46 | 0.13 |          |         |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

support for hypothesis 4b (rehabilitation support). There was no support found for hypotheses 1b, 2b, 3b, or 5b (Table 6).

### Model testing

We then used SEM again to the mechanisms through which the experimental manipulations influenced study outcomes. All hypotheses were examined by first inspecting the fit of the final structural model specified during analysis and then interpreting the model's path coefficients. The final structural model had less than ideal model fit (*Satorra-Bentler adjusted  $\chi^2_{df} = 637 = 1249.489$ ,  $\chi^2/df$  ratio = 1.96, RMSEA = .063, 90% CI [.058, .068],  $p < .01$ , CFI = .882 SRMR = .102*) (Hu & Bentler, 1999). While the  $\chi^2/df$  ratio was within the recommended range for good model fit, the remaining fit indices were not. As such, all remaining hypotheses from the model are interpreted with caution. Additional explanations for this finding are offered in the discussion section. Results supported most

**Table 7.** Study 2 indirect effects.

| From           | To                                  | Estimate  | S.E.  | Est./S.E. |
|----------------|-------------------------------------|-----------|-------|-----------|
| Classification | Behavioral Regulation               | 0.183**   | 0.063 | 2.893     |
| Enactment      |                                     | 0.235***  | 0.061 | 3.852     |
| Classification | Social Distance                     | -0.116**  | 0.042 | -2.726    |
| Enactment      |                                     | -0.149*** | 0.042 | -3.547    |
| Classification | Support for Rehab (MAT)             | -0.024    | 0.02  | -1.21     |
| Enactment      |                                     | -0.031    | 0.024 | -1.329    |
| Classification | Support for Rehab (Behavioral only) | -0.013    | 0.02  | -0.642    |
| Enactment      |                                     | -0.017    | 0.026 | -0.635    |
| Classification | Support for Narcan                  | -0.024    | 0.02  | -1.249    |
| Enactment      |                                     | -0.031    | 0.022 | -1.405    |
| Classification | Stigma Message Sharing              | 0.024     | 0.014 | 1.709     |
| Enactment      |                                     | 0.03*     | 0.015 | 1.994     |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

model hypotheses (Figure 3). However, no relationship was found between danger appraisal and support for behavioral rehabilitation (H7b) or danger appraisal and common ground (H9a).

**Tests of indirect effects.** Mediation analyses with bootstrapping (1,000 samples) were conducted for all possible indirect effects in the model, and five were significant. First, classification messages had a significant indirect effect on behavioral regulation and social distance, each mediated through danger appraisal. Enactment messages had a significant indirect effect on behavioral regulation and social distance, each mediated through danger appraisal. Finally, enactment had a significant indirect effect on stigma message sharing, mediated through danger appraisal and shock. No other indirect effects were significant (Table 7).

## Discussion

Compounding rising rates of drug overdose deaths (CDC, 2020a, 2021) is the circulation of stigmatizing messages about people with substance use disorders like an opioid use disorder (OUD). Opioid stigma communication is prevalent in the news (McGinty et al., 2019) and is negatively associated with support for treatment-oriented public policies (e.g., Kennedy-Hendricks et al., 2017). Opioid stigma messages can cause greater attributions of responsibility (Kelly & Westerhoff, 2010), implicit bias (Ashford et al., 2018), and negative affect (Goodyear et al., 2018), and are associated with an increased desire for punitive action (Kelly & Westerhoff, 2010). Combatting opioid stigma requires continued research on the effects of stigmatizing messages about opioids and people with OUDs. The current study sought to contribute to this body of literature by offering a theoretical test of a message-centered stigma theory, the model of stigma communication (MSC; Smith, 2007; Smith et al., 2019). The MSC has only been examined in a few select contexts, such as fictitious infectious diseases (Smith, 2012, 2014; Smith et al., 2019) and Autism Spectrum Disorders (Underhill et al., 2019). Thus, an additional contribution of the current investigation is its application of the MSC in a new health context.

Results from two experimental studies offer insight into the impacts of stigmatizing messages about opioids and the mediating pathways through which stigma messages influence stigma-related outcomes. Study 1 offers results and directions for future research

about the direct effects of stigma messages and the mediation processes through which they impact stigma-related outcomes. While Study 2 supplements these findings for stigma messages' direct effects, the poor model fit in Study 2 prevents *any* mediation conclusions. As such, our discussion relies on both studies' analyses of direct effects and Study 1's model testing. The limitations section offers explanations for the model fit in Study 2.

## Consequences of stigma messages

Both studies offer preliminary evidence that stigmatizing markers and labels (classification messages) about people with OUDs can directly influence public perceptions about and decision-making related to individuals with OUDs. Results from both studies suggest that the greater the stigma classification, including a visual marker of stigma (e.g., "unkempt appearance") and a stigmatizing label (e.g., "addict"), the more people saw a person with an OUD as dangerous to the public and personally threatening. When exposed to stigmatizing classification messages, study 2 participants also expressed more desire for behavioral regulation and social distance. Both studies found significant effects for classification messages, but on different stigma-related outcomes. At least, our results contribute to research indicating that stigmatizing messages about opioids can have harmful effects (Ashford et al., 2018; Goodyear et al., 2018). At best, they offer insight into the specific types of beliefs and attitudes (e.g., dangerousness, threat, behavioral regulation, social distance) that may result from stigma classification messages. Future research should seek to replicate these findings across samples and contexts.

Results from both studies also found that stigmatizing messages that include attributions of responsibility and peril (enactment messages) can directly affect stigma-related outcomes. Results from Study 1 found that high enactment messages led to a greater desire for social distance from people with OUDs. Study 2 found that high enactment messages led to greater perceptions of threat and dangerousness in addition to less support for policies that would promote behavioral rehabilitation. However, the findings from these two studies do not mirror one another, and this inconsistency warrants further discussion.

Particularly in consideration of the failed enactment manipulation check in Study 2, results from the enactment messages should be interpreted with immense caution. Across high and low enactment groups, participants rated the person in the message (Alex) as highly responsible (>65/100) and as having great consequences toward others (>62/100). Conversely, manipulation of the classification conditions (i.e., marks, labels) demonstrated significant differences between low and high conditions. Future work should thus seek to develop more nuanced enactment manipulations. For example, Heley et al. (2019) found that narrative messages – depicting how industry marketing can influence the development of an OUD – reduced responsibility attributions. Narrative elements might offer a way forward in understanding how to manipulate responsibility and peril (enactment) messages. Finally, additional research may also want to consider message order effects since reading a classification message *before* an enactment message may have influenced participant responses.

## Processes of stigma messages and the MSC

While this study is limited in its ability to fully comment on the mediation processes of stigma message effects, results from Study 1 offer preliminary support for the revised MSC among a college student sample and suggest potential avenues for revision. Initially, the revised MSC (Smith et al., 2019) situates danger appraisal as a full mediator, meaning that stigma messages only exert influence on outcomes *through* danger appraisal, not on their own.

Potential support for this mediation is offered in two ways. First, past MSC research has found that the most consistent direct effects of stigma messages are on perceived dangerousness (Smith, 2012, 2014). The same is true for the current research, as perceived dangerousness was influenced by stigma messages in both studies. Second, in examining the structural equation model in Study 1, researchers conducted tests of indirect effects that suggest the plausibility of full mediation. Results indicated that classification messages significantly and indirectly predicted three (behavioral regulation, social distance, and support for Naloxone policies) of the five study outcomes through danger appraisal. However, no indirect effects were significant for the enactment messages. This finding is not surprising since the enactment manipulation was not as clear as the classification manipulation. Manipulating the word “addict” versus “person who misuses opioids” is simple (classification), but changing the nature of who is responsible for the OUD and its potential consequences on others (enactment) is not as straightforward. As such, the findings from these two studies support prior MSC research (Smith et al., 2019) and suggest that danger appraisal may be the central process at work in stigma communication about people with OUDs. Future research should investigate how different stigma message features influence stigma-related outcomes through different mediators beyond danger appraisal.

That said, providing evidence for a complex causal process such as the one outlined in the revised MSC (Smith et al., 2019) would require a more stringent study design and a clearer understanding of population differences. One area of work for future study is to understand why the MSC did not similarly fit both samples. Most empirical research on the MSC has been conducted among college student samples. Criticisms of college student samples suggest that these samples may be fundamentally different than other populations (Henrich et al., 2010). While MTurk samples also face their fair share of criticism (Chmielewski & Kucker, 2020), the conflicting findings between our two studies suggest that college student samples cannot be used to generalize to the entire U.S. adult population. Scholars will want to consider these population differences and any potential individual-level moderators in future work on the MSC.

Finally, the use of the individual-level measures in these studies provides additional support for the claim that stigma affects groups *and* individuals. Smith (2014) found that stigma messages could influence stigma outcomes at the individual level (e.g., Alex) as opposed to only at the group level (e.g., people with an OUD). The current studies

validate this finding, as we assessed participant perceptions about a specific person with an OUD rather than all people with OUDs. Results suggest that while stigma may be enacted at the group-level, it has consequences for the individual as well. Future research may further seek to understand how people generalize stigma from the individual to the group and vice versa.

## Limitations

First, this study was conducted in an online experimental setting and used a hypothetical news article. While the authors tried to develop realistic stimuli using language from real opioid-related news articles, the artificiality of this setting limits its generalizability outside of the laboratory. Second, the experimental survey relied on self-report measures, which may be biased by social desirability concerns, particularly for a stigmatizing topic like opioids. In addition, the poor model fit and failed enactment manipulation check of Study 2 limits one aim of this study in providing a conceptual replication of Study 1 as well as in interpreting the results. While an attempt to create ecologically valid messages, the enactment manipulations in Study 2 may have differed by more variables than just the level of responsibility and peril stigma. More tightly controlled manipulation messages can be used in future research. Next, it is worth noting that the manipulation check in Study 2 revealed much larger marking differences than labeling differences between conditions. Collapsing these features into a single message manipulation is thus a limitation that future research can address. Lastly, while this study offers theoretical explanations of causal mechanisms, the mediation results should only be interpreted as correlational, not causal. Further experimentally manipulating the mediator would offer a better explanation of the causal mediation process (Pirlott & MacKinnon, 2016).

## Conclusion

Opioid overdoses are a growing and concerning problem. As health researchers, practitioners, and policymakers seek solutions to the opioid crisis, they may wish to consider stigma as an important influencer of public support for people with OUDs and opioid-related policies. Researchers (Tsai et al., 2019) and government agencies have begun calling for more interventions and research on the detriment of opioid stigma. This study contributes to the body of opioid stigma literature that points to a shared finding – stigmatizing language about opioids and people with OUDs does *not* promote favorable interpersonal or public health outcomes. As journalists continue to document the opioid epidemic, our results, coupled with past research, suggest that describing people with OUDs as “addicts” can have harmful effects on public perceptions and public support for policies aimed to curb the opioid epidemic. Moreover, imagery and language used to represent people with OUDs is also an important factor, and “marking” an individual with an OUD as unseemly should be avoided. While more research is needed to illuminate how responsibility attributions and references to societal consequences

influence stigma-related outcomes, journalists, health practitioners, and policymakers would be wise to exert caution and consult research before issuing public communication about people with OUDs. As the opioid crisis continues, it seems that one obvious but overlooked premise remains true: the messages we use to describe people with Opioid Use Disorders *matter*.

## Notes

1. This study uses people-first language to describe individuals with OUDs. As Broyles et al. (2014) note, people-first language can reduce stigma and counter the stigmatizing language that may otherwise be used to talk about people with OUDs, such as “substance abuser” or “addict.” We want to embody this practice in writing about our research, especially since our research examines how these terms have negative effects.
2. IRB approval was obtained [1389630–2], and signed consent was waived for participants due to the sensitive nature of the topic under study. Participants still completed the informed consent process by reading the consent form and selecting “yes” if they were 18 years or older and agreed to participate in the study.
3. For a complete list of study measures, please contact the primary author.
4. The manipulation attempted to use person-centered language (e.g., “people who misuse opioids” instead of “opioid addicts”) to manipulate classification (Broyles et al., 2014). However, the term “person with an opioid use disorder (OUD)” is the preferable and less stigmatizing term. Unfortunately, the authors learned this after running the experiments.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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## Appendix A. Experimental Stimuli

“Opioids are a Rising Problem in the U.S.”

By Jim Tripp

February 6, 2019

[same introductory paragraph in all manipulations] Opioid use has become a rising problem in the United States. All around the country, people are trying to understand this problem. With rising rates of addiction, overdoses, and deaths, some have even begun to call the opioid problem in the United States a full blown epidemic. People are taking prescription opioids in doses other than what they are prescribed, taking opioids from other people, and taking different types of opioids to get high. Across the country, policymakers, health professionals, and everyday citizens are working to combat the opioid epidemic.

For **opioid addicts** (*people who misuse opioids*<sup>4</sup>) everyday can be a struggle. Alex Carlum knows this all too well. Alex is an **opioid addict** (*person who misuses opioids*) who you might pass on the street one day. Alex might also be your neighbor, friend, or family member. If you see Alex out and about, you might notice Alex's **tarnished** (*clean*) clothes or pay attention to how Alex appears **unkempt** (*put-together*). Alex is one of many individuals who struggle with opioid abuse.

While the opioid epidemic is a tragedy, Alex made the choice to take opioids and continue using them. Opioid addicts influence those around them, and Alex is no different. If Alex continues on this path, there may be consequences for friends, family, and our community. Whether it's a severed relationship, emotional abuse, or a toxic community environment, Alex's actions affect others.

[Low classification and low enactment paragraph that would replace the above paragraph] (*Alex is one of the victims of that tragedy. People who misuse opioids face their share of struggles, but people around them often do not know what battles they face. Alex often experiences the consequences of addiction alone. Alex suffers from isolation, social rejection, and even experiences the physical effects of drug addiction alone.*)

[same conclusion paragraph in all manipulations] Alex is just one of the many faces of the opioid epidemic. In 2019, our country continues to work to combat this growing problem.

Note. Condition 1 pictured above: (**High Classification, High Enactment**)

Note\* Low classification and enactment features are pictured in *parentheses and italics* next to the high classification and enactment features pictured above.

Note\*\* All text was presented in a regular format for participants. Details are presented in this format here for reader understanding.

Note\*\*\* These categories align with the MSC's (Smith, 2007) conceptualizations of message features but collapsed the four categories into two theoretically relevant subsets: classification (marks and labels) and enactment (responsibility and peril).