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Impressions of People Who Use Opioids Depend on the Origin of Their Use

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Abstract

Opioid addiction poses a major public health challenge that is exacerbated by pervasive stigma toward people who use opioids. Four experiments (N_{total} = 1,551 participants) investigated whether and how impressions of people who use opioids differ based on how their use originated. People whose opioid use began for recreation evoked more negative reactions (e.g., less trustworthiness, more desired social distance) than people whose use began for managing physical pain. Opioid use for coping with emotional pain elicited intermediate impressions, potentially suggesting moral ambiguity. Both positivity impressions and blameworthiness attributions mediated the effect of opioid use origin on stigma toward physical pain-related versus recreation-related opioid use. Moreover, blameworthiness attributions causally influenced desired social distance, even when holding opioid use origin constant. These findings indicate that opioid use stigma varies depending on the initial reason for a person's use.

Keywords: attribution; impression formation; person perception; stereotyping; stigma

Impressions of People Who Use Opioids Depend on the Origin of Their Use

The opioid epidemic is an urgent public health crisis, inflicting devastating consequences on people, families, and communities. Although its impacts have been most acute in North America, where opioid overdose deaths are highest (Ahmad et al., 2024), similar trends are evident globally. Opioid-related deaths in the United Kingdom, Guyana, New Zealand, Australia, and numerous European countries highlight the crisis's international scope (Degenhardt et al., 2019). These trends underscore the need to mitigate the opioid epidemics' impacts and to identify factors that undercut such efforts. Understanding impressions of people who use opioids is crucial, because these impressions can manifest as stigma, creating barriers to life-saving treatment and undermining public health efforts (Earnshaw, 2020).

Social perceivers readily generate inferences about others' enduring traits (Winter & Uleman, 1984) and transitory psychological states (Kruse & Degner, 2021) from relevant available information. These initial inferences can have lasting impacts, creating frameworks that shape future expectations and guide behavior (Uleman et al., 2008). Social categorization processes further organize these inferences into coherent impressions and group stereotypes (Macrae & Bodenhausen, 2000). Insofar as the initial information encountered about someone provides a context that shapes impressions of them (Asch, 1946), elucidating these processes—our aim here—is important for understanding impressions of people who use opioids.

Opioid Use Stigma

Accumulating psychological research has investigated the nature and consequences of substance use stigma, including what facilitates its development and maintenance (Krendl & Perry, 2023). Negativity toward people who use opioids is pervasive (Earnshaw, 2020), with applicable stereotypes (e.g., dangerous, unpredictable, lacking self-control) magnifying this

stigma (Corrigan et al., 2009). Stigma, in turn, adversely affects people who use opioids by enabling internalized shame (Birtel et al., 2017) and creating barriers to treatment (Livingston et al., 2012). Stigma can also perpetuate health disparities by shaping public sentiment toward mitigation policies (Cheetham et al., 2022).

Notably, however, opioid use stigma varies by substance. For example, desired social distance, a widely used measure of stigma (Link et al., 1987), is greater for people using heroin than for people using prescribed opioids (Krendl & Perry, 2023). Similarly, opioid use evokes greater stigma than alcohol or cannabis use (Forstmann & Sagioglou, 2025), suggesting that a substance's social acceptability and/or legality might shape impressions of the people using it. An underexplored aspect of substance use stigma is whether and how the origin of substance use shapes person impressions, even when the substance itself is held constant.

Attributions for Opioid Use

Insofar as reactions to others' behaviors are informed by the factors giving rise to those behaviors (Weiner et al., 1988), the origin of a person's opioid use could influence the stigma they face. Mental health conditions deemed controllable (e.g., substance use disorders) are more heavily stigmatized than conditions deemed uncontrollable (e.g., schizophrenia; Corrigan, 2000, 2003). These differential attributions illustrate how impressions might depend on the degree to which a person's behavior follows institutionally-sanctioned norms and practices—its perceived legitimacy (Suchman, 1995). According to the theory of dyadic morality (Schein & Gray, 2018), when forming impressions in morally-relevant contexts, people frequently engage in "moral typecasting", classifying targets either as moral *agents*—capable of acting intentionally and responsible for their own outcomes—or as moral *patients*—experiencing suffering due to circumstances beyond their control (Gray & Wegner, 2009; see also Weiner, 1993).

Conceivably, one's opioid use origin could shape attributions of blame, responsibility, and controllability. For example, using opioids recreationally might be construed as an active choice and attributed to poor self-control, whereas using opioids for pain might be attributed to circumstances beyond a person's control. The origin of a person's opioid use could direct this typecasting: People prescribed opioids for physical pain might be encoded as moral patients experiencing legitimate suffering. Conversely, people using opioids recreationally might be encoded as moral agents making intentional, blameworthy decisions. Opioid use for emotional pain could occupy a middle territory wherein perceivers acknowledge suffering but question its legitimacy, creating moral ambiguity. Tension may arise with emotional pain that has neither a clear physical basis nor a medical justification for opioid use, potentially prompting attributions of patient-like suffering and agent-like responsibility for unsanctioned self-medication choices.

These attributions, in turn, could plausibly drive stigma, including desired social distance. Across various stigmatized conditions (e.g., health conditions, substance use disorders), ascriptions of personal responsibility predict desired social distance (Corrigan et al., 2003; Weiner et al., 1988). Although previous research has examined how substance use and recovery status affect desired social distance (McGinty et al., 2015), to our knowledge, no work has considered the relations among substance use origin, attributions for substance use, and desired social distance. Investigating these relations is important because stigma predicts treatment dropout and hinders recovery (Corrigan et al., 2009). Moreover, origin-based attributions for substance use could create a harmful feedback loop: Stigma may fuel isolation, which could increase substance use, thereby reinforcing stigma (Cheetham et al., 2022).

In sum, this work aims to provide a multi-method test of how the origin of opioid use affects social impressions and desired social distance. We build on existing attributional models

by examining potential pathways connecting origin of use to stigma, thereby offering an evidence-based account of how everyday attributional reasoning shapes opioid use stigma.

The Current Research

Four experiments tested whether the origin of a person's opioid use shapes impressions of them. We aimed to address two primary questions: First, relative to people whose opioid use began for their intended purpose (i.e., alleviating physical pain), are people whose use began for other reasons (e.g., recreation, alleviating emotional pain) viewed as more blameworthy? Second, do blameworthiness attributions, in turn, predict greater desired social distance?

Experiment 1 manipulated target information in vignettes describing a person using opioids for pain relief or recreation. We also included two control vignettes: one describing a person using over-the-counter medication (OTCM) for pain relief and another describing a person who is neither using opioids nor experiencing pain. This design allowed us to vary target information consistently across vignettes and to identify potential differences in impressions of people using opioids versus non-opioid medications for pain. We assessed target impressions on various characteristics (e.g., trustworthiness, perceived suffering, deservingness of compassion).

Experiment 2 included a vignette describing a person using opioids to manage *emotional* pain, allowing us to examine if impressions differ based on the perceived legitimacy of use. Alongside assessing deliberate target impressions, we assessed spontaneously-activated target impressions using a two-phase procedure: Phase-1 participants generated verbal profiles of the targets and rated them on various characteristics, and phase-2 participants evaluated the profiles on the same characteristics. Specifically, we measured desired social distance as a focal outcome and blameworthiness attributions and positivity impressions as potential mediators.

Experiment 3 investigated the distinct role of legality, comparing impressions of people with the same underlying pain condition but differing in how they obtained opioids: legally with a prescription versus illegally without one. Experiment 4 tested a causal mechanism suggested by Experiment 2's correlation-based mediation analyses. We manipulated blameworthiness attributions while holding constant opioid use origin (i.e., physical pain relief), allowing us to test their causal influence on desired social distance.

Transparency and Openness

For all experiments, we describe our sample size rationale and report all data exclusions,[1] manipulations, and measures. Data were analyzed using the following packages in R (Version 4.3.3; R Core Team, 2024): *ggplot* (Version 3.2.1; Wickham, 2016), *lavaan* (Version 0.6-17; Rosseel, 2012), *lme4* (Version 1.1-35.1; Bates et al., 2015), *lmerTest* (Version 3.1-3; Kuznetsova et al., 2017), and *simr* (Version 1.0.7; Green & MacLeod, 2016). We also used the *mc_power_med* shinyapp (Schoemann et al., 2017). The analysis plan for Experiment 3 was preregistered: https://aspredicted.org/bq98-f6jt.pdf. All data, analysis code, research materials, and Supplemental Materials are available at https://tinyurl.com/53v58f7p.

Experiment 1

Method

Participants

Across experiments, we recruited Amazon's Mechanical Turk (MTurk) workers 18 years of age or older from the United States via CloudResearch (Litman et al., 2017). To maximize data quality, we only sampled CloudResearch-approved workers (Hauser et al., 2023) with approval ratings ≥95%. In Experiment 1, we set a target sample size using a heuristic of ~100

[1] All data exclusion decisions were made a priori before any data were analyzed.

participants per condition, or ~400 participants in our four-condition between-subjects design. In total, 418 adults participated for pay. We excluded data from participants who did not complete the entire survey (n = 38), failed the attention check (see details below; n = 13), or requested that we discard their data (n = 4). The final sample comprised 363 participants, which afforded ≥80% power to detect effects of vignette condition as small as $\eta^2 = .027$ on a given characteristic in a one-way analysis of variance (ANOVA; Faul et al., 2007). Table 1 displays participant demographics for all experiments.

Procedure

Participants were randomly assigned to read one of four vignettes describing a person who uses opioids recreationally, uses opioids to manage pain, uses over-the-counter medications (OTCM) to manage pain, or neither uses opioids nor has pain (control). Participants first read:

> One weekend evening about a year ago, **[redacted]** drove to a neighboring town to visit a friend. Things had been busy lately, and **[redacted]** was glad to hang out with a friend after a stressful week.

Participants then read an excerpt describing the ensuing events, which differed across conditions. In the opioids-for-recreation condition, the person tried opioids recreationally at their friend's house and then began using opioids regularly. In the opioids-for-pain and OTCM-for-pain conditions, the person sustained serious injuries in a car accident and developed chronic pain. In the opioids-for-pain condition, participants read, "To manage the pain, [redacted] decided to try a prescribed opioid medication. Over the next several months, [redacted] tried other opioids for pain relief. Now, [redacted] uses opioids on a regular basis." In the OTCM-for-pain condition, the phrase "extra-strength over-the-counter medication" replaced "prescribed opioid medication", and "over-the-counter medications" replaced "opioids". In the control

condition, the person watched a nature documentary at their friend's house and then began watching documentaries regularly (see the Supplemental Materials for the full vignettes).

Participants then rated the person on three traits relevant for person impressions (Oosterhof & Todorov, 2008): trustworthiness, dominance, and threat (1 = *extremely untrustworthy/submissive/unthreatening*, 7 = *extremely trustworthy/dominant/threatening*). They also rated the person's suffering and deservingness of compassion (1 = *not at all*, 7 = *extremely*).

Next, participants completed an attention check by selecting from among several options the one reflecting the content of the vignette they read. They also completed two items assessing their confidence in explaining opioids to a friend (1 = *not at all*, 4 = *very*) and experience encountering media stories about opioids (1 = *never*, 2 = *rarely*, 3 = *occasionally*, 4 = *often*). We included these items to determine if this participant population had sufficient familiarity with opioids to form impressions based on the information in the vignettes (see the Supplemental Materials for moderation analyses involving opioid familiarity). Overall, 97.8% of participants reported some familiarity with opioids. Finally, participants reported demographics.

Results

Analysis Strategy

We submitted the target ratings to separate one-way between-subjects ANOVAs followed by Bonferroni-corrected comparisons.[2] Figure 1 displays the pattern of means for all outcome variables. Table S1 displays descriptive statistics for all conditions.

Trustworthiness

Trustworthiness impressions varied by vignette condition, $F(3, 359) = 59.65$, $p < .001$, $\eta^2 = .33$, $CI_{90\%}$ [.27, .39]. Relative to the control target, the target using opioids for recreation,

[2] In some cases, confidence intervals (CIs) exclude 0, whereas the corresponding *p*-value drops to non-significance after adjusting for multiple comparisons.

$t(182) = 12.69$, $p < .001$, $d = 1.87$, $CI_{95\%}$ [1.52, 2.22], the target using opioids for pain, $t(179) = 5.01$, $p < .001$, $d = 0.74$, $CI_{95\%}$ [0.44, 1.05], and the target using OTCM for pain, $t(174) = 2.75$, $p = .040$, $d = 0.41$, $CI_{95\%}$ [0.11, 0.71], were all ascribed less trustworthiness. Also, the target using opioids for recreation was rated as less trustworthy than the targets using opioids for pain, $t(185) = 7.72$, $p < .001$, $d = 1.13$, $CI_{95\%}$ [0.82, 1.44], and OTCM for pain, $t(180) = 9.02$, $p < .001$, $d = 1.34$, $CI_{95\%}$ [1.02, 1.66], whereas the targets using opioids for pain and OTCM for pain did not significantly differ, $t(177) = 1.83$, $p = .413$, $d = -0.27$, $CI_{95\%}$ [-0.57, 0.02].

Dominance

Dominance impressions also differed by vignette condition, $F(3, 359) = 18.66$, $p < .001$, $\eta^2 = .14$, $CI_{90\%}$ [.07, .20]. Relative to the control target, the target using opioids for recreation was ascribed less dominance, $t(182) = 3.64$, $p = .002$, $d = 0.54$, $CI_{95\%}$ [0.24, 0.83], whereas that target using OTCM for pain was ascribed more dominance, $t(174) = 3.74$, $p < .001$, $d = 0.56$, $CI_{95\%}$ [0.26, 0.86]. The control target and the target using opioids for pain did not significantly differ, $t(179) = 0.72$, $p = .999$, $d = 0.11$, $CI_{95\%}$ [-0.19, 0.40]. The target using opioids for recreation was rated as less dominant than the targets using opioids for pain, $t(185) = 4.31$, $p < .001$, $d = 0.63$, $CI_{95\%}$ [0.34, 0.92], and OTCM for pain, $t(180) = 6.89$, $p < .001$, $d = 1.02$, $CI_{95\%}$ [0.71, 1.33]. Finally, the target using opioids for pain was ascribed less dominance than the target using OTCM for pain, $t(177) = 3.05$, $p = .016$, $d = 0.46$, $CI_{95\%}$ [0.16, 0.75].

Threat

Threat impressions also varied by vignette condition, $F(3, 359) = 17.18$, $p < .001$, $\eta^2 = .13$, $CI_{90\%}$ [.06, .19]. Relative to the control target, all other targets were rated as more threatening (ts > 3.65, ps < .003, ds > 0.55). The target using opioids for recreation was rated as more threatening than the targets using opioids for pain, $t(185) = 3.33$, $p = .006$, $d = 0.49$, $CI_{95\%}$ [0.20, 0.78], and OTCM for pain, $t(180) = 3.39$, $p = .005$, $d = 0.50$, $CI_{95\%}$ [0.21, 0.80], whereas

the targets using opioids for pain and OTCM for pain did not significantly differ, $t(177) = 0.13$, $p = .999$, $d = 0.02$, $CI_{95\%}$ [-0.27, 0.31].

Perceived Suffering

Perceived suffering differed by vignette condition, $F(3, 359) = 79.29$, $p < .001$, $\eta^2 = .40$, $CI_{90\%}$ [.32, .46]. Relative to the control target, all other targets were rated as experiencing greater suffering (ts > 8.48, ps < .001, ds > 1.25). Also, the target using opioids for recreation was rated as suffering less than the targets using opioids for pain, $t(185) = -4.20$, $p < .001$, $d = -0.61$, $CI_{95\%}$ [-0.91, -0.32], and OTCM for pain, $t(180) = -2.88$, $p = .027$, $d = -0.43$, $CI_{95\%}$ [-0.72, -0.13], whereas the targets using opioids for pain and OTCM for pain did not significantly differ, $t(177) = 1.43$, $p = .925$, $d = 0.21$, $CI_{95\%}$ [-0.08, 0.51].

Deservingness of Compassion

Deservingness of compassion also varied by vignette condition, $F(3, 359) = 27.86$, $p < .001$, $\eta^2 = .19$, $CI_{90\%}$ [.12, .25]. Relative to the control target, the target using opioids for recreation was rated as less deserving of compassion, $t(182) = 5.00$, $p < .001$, $d = -0.74$, $CI_{95\%}$ [-1.04, -0.44]. In contrast, neither the target using OTCM for pain, $t(174) = 2.60$, $p = .061$, $d = 0.39$, $CI_{95\%}$ [0.09, 0.69], nor the target using opioids for pain, $t(179) = -2.40$, $p = .105$, $d = 0.36$, $CI_{95\%}$ [0.06, 0.65], significantly differed from the control target. Also, the target using opioids for recreation was rated as less deserving of compassion than the targets using opioids for pain, $t(185) = -6.90$, $p < .001$, $d = -1.01$, $CI_{95\%}$ [-1.31, -0.70], and OTCM for pain, $t(180) = -6.94$, $p < .001$, $d = -1.03$, $CI_{95\%}$ [-1.34, -0.72], whereas the targets using opioids for pain and OTCM for pain did not significantly differ, $t(177) = -0.23$, $p = .999$, $d = -0.03$, $CI_{95\%}$ [-0.33, 0.26].

Discussion

Impressions of people who use opioids differed based on the origin of their use. Using opioids recreationally (and, indeed, socially) was viewed less favorably than using opioids for pain, suggesting that people form distinct impressions based on how someone's opioid use began. Impressions of people with chronic pain from injuries sustained in a car accident did not significantly differ based on their pain management method (opioids vs. OTCM) after adjusting for multiple comparisons, except that people using OTCM for pain were ascribed more dominance. Using opioids for their intended purpose (i.e., pain relief) may not evoke appreciably different impressions than using non-opioid medications for the same purpose, though subtle differences did emerge. These findings support an origin-sensitive framework, whereby the reason for initial opioid use—rather than use itself—shapes person impressions. Granted, impressions based on pain management method might differ when assessed less overtly. Self-report measures are vulnerable to strategic self-presentation (Nosek, 2007), and discrepancies between spontaneous and deliberate substance use impressions have been reported, with greater stigma emerging in the former (Brener et al., 2007; von Hippel et al., 2008).

Experiment 2

Experiment 2 used a two-phase procedure to capture the descriptive content of characteristics of people who use opioids. Phase-1 participants read one of several vignettes, generated a descriptive profile of the target, and evaluated the target on several characteristics. Phase-2 participants, who had no knowledge about whom the profiles described, evaluated the profiles on these same characteristics. Notably, because phase-1 participants were never prompted to consider these characteristics, this two-phase procedure affords an assessment of phase-1 participants' impressions via phase-2 participants' ratings of the former's profiles. Accordingly, this approach may offer insight into spontaneously-evoked impressions of people

who use opioids (Elderkin et al., 2026; Gallagher & Bodenhausen, 2021; Petsko & Bodenhausen, 2019). In addition, all vignettes described a person using opioids. Whereas addiction was never mentioned (though arguably implied) in Experiment 1, here and in subsequent experiments the vignettes explicitly mentioned addiction, removing ambiguity about the extent of opioid use. Alongside conditions depicting people who began using opioids for recreation and for physical pain relief, we included a condition depicting a person who began using opioids to manage *emotional* pain, which allowed us to test if the type of pain (physical vs. emotional) matters. Finally, we assessed desired social distance as a focal outcome and examined potential mediators—positivity impressions and attributions for addiction—that might help explain opioid use origin effects on this outcome.

Method

Phase 1: Profile Generation

Participants (Profile Generators). To our knowledge, there is no consensus about a priori power analysis calculations for phase 1 in two-phase approaches like that used here (see also Elderkin et al., 2026). We set a target sample size using a heuristic of ~150 participants per condition, or ~450 participants in phase 1's three-condition between-subjects design. In total, 476 adults participated for pay. We excluded data from participants who did not complete the entire survey ($n = 3$) or failed the attention check ($n = 34$). The final sample comprised 439 participants, which afforded ≥80% power to detect effects as small as $\eta^2 = .022$ in one-way ANOVAs on the impressions reported in phase 1 (Faul et al., 2007), and indirect effects in mediation analyses as small as $b = 0.06$ (Schoemann et al., 2017).

Procedure. Participants were randomly assigned to read a vignette describing a person who is addicted to opioids and began using them for recreation, for physical pain relief, or for

emotional pain relief. Participants first read, "Opioid use and opioid addiction are extremely high in the United States. People can begin using opioids for a variety of different reasons and subsequently develop an addiction." They then read, "We are interested in your impressions of opioid users[3] who initially started taking opioids [**for recreation/to manage physical pain/to cope with emotional pain**]."

After reading the vignette, participants completed a profile-generation task, wherein they listed the first five adjectives that came to mind describing someone who began using opioids for one of the above reasons (Elderkin et al., 2026; Gallagher & Bodenhausen, 2021; Petsko & Bodenhausen, 2019). Table 2 displays the top five adjectives by vignette condition.

Participants then rated the target on eight items tapping a range of person impressions (trustworthiness, morality, dangerousness, criminality, and addiction recovery likelihood) and attributions for addiction (fault, controllability, and personal responsibility; 1 = *not at all*, 7 = *extremely*) drawn from the addiction literature (Corrigan et al., 2003; Mantler et al., 2003; Shaver, 1985; Weiner et al., 1988). Next, they completed a six-item measure of desired social distance (adapted from Link et al., 1987). Example items include, "How would you feel about working on the same job as someone who initially started using opioids [for recreation/physical pain/emotional pain]?" and "How would you feel about having your children marry someone who initially started using opioids [for recreation/physical pain/emotional pain]?" (0 = *definitely willing*, 3 = *definitely unwilling*).[4] Finally, participants completed a modified version of the

[3] Our materials used the label "opioid users," which can be stigmatizing. APA recommends person-first language (e.g., "people who use opioids"); however, we retain our original phrasing to reflect what participants saw.
[4] Exploratory factor analysis of the social distance scale suggested a two-factor solution; however, we averaged all 6 items into a single composite to maintain clarity, parsimony, and consistency with previous work (see Supplemental Materials for full details).

attention check and the same items assessing familiarity with opioids from Experiment 1 (98.1% of participants reported some familiarity) and reported demographics.

Phase 2: Profile Assessment

Participants (Profile Raters). We set a target sample size using a heuristic of ~150 participants for each of two sets of profile ratings. In total, 374 adults participated for pay. We excluded data from participants who did not complete the entire survey (n = 15) or failed the attention check (n = 43). The final sample comprised 316 participants, which afforded ≥80% power to detect effects as small as b = 0.07 for a given impression in the linear mixed-effects models reported in phase 2, based on a sensitivity analysis for a crossed random-effects design (Green & MacLeod, 2016).

Procedure. Participants read descriptive profiles of multiple people and formed an impression of each person based only on the traits in their profile, which appeared in the exact order listed by profile generators. Of the 411 profiles generated in phase 1, each phase-2 participant rated a randomized set of 36 profiles (12 per condition) either on trustworthiness (1 = *not at all trustworthy*, 7 = *extremely trustworthy*; n = 157 participants) or on desired social distance (two items; 0 = *definitely willing*, 3 = *definitely unwilling*; n = 159).[5] Finally, they completed an attention check (Levesque et al., 2011) and reported demographics.

Results

Profile-Generation Phase

Analysis Strategy. We first conducted an exploratory factor analysis on eight variables: trustworthiness, morality, danger, recovery likelihood, criminality, fault, controllability, and

[5] We selected the single items that best predicted each subscale of the social distance scale that emerged in our exploratory factor analysis (see footnote 5 and Supplemental Materials): "How would you feel about having your children marry the described person?" and "How would you feel about having the described person as a neighbor?"

responsibility. Parallel analysis suggested a two-factor solution. The first factor, which we labeled "positivity impressions," included trustworthiness, morality, danger (reverse scored), criminality (reverse scored), and recovery likelihood ($\alpha = 0.78$). The second factor, which we labeled "blameworthiness attributions," included responsibility, fault, and controllability ($\alpha = 0.86$). For desired social distance, we created a composite measure by averaging all six items from the social distance scale ($\alpha = 0.88$). Next, we submitted positivity impressions, blameworthiness attributions, and desired social distance to one-way between-subjects ANOVAs followed by Bonferroni-corrected comparisons. Figure 2 displays the pattern of means on all outcome variables. Table S2 displays descriptive statistics for all conditions.

Positivity Impressions. Positivity impressions varied by vignette condition, $F(2, 436) = 90.01$, $p < .001$, $\eta^2 = .29$, $CI_{90\%}$ [.23, .34]. Targets using opioids for recreation, $t(289) = 13.34$, $p < .001$, $d = 1.56$, $CI_{95\%}$ [1.30, 1.83], and for emotional pain, $t(294) = 7.94$, $p < .001$, $d = 0.92$, $CI_{95\%}$ [0.68, 1.16], were ascribed less positivity than the target using opioids for physical pain. The target using opioids for recreation was rated less positively than the target using opioids for emotional pain, $t(289) = 5.52$, $p < .001$, $d = 0.65$, $CI_{95\%}$ [0.41, 0.88].

Blameworthiness Attributions. Blameworthiness attributions differed by vignette condition, $F(2, 436) = 47.36$, $p < .001$, $\eta^2 = .18$, $CI_{90\%}$ [.13, .23]. Targets using opioids for recreation, $t(289) = 9.84$, $p < .001$, $d = 1.15$, $CI_{95\%}$ [0.90, 1.40], and for emotional pain, $t(294) = 4.59$, $p < .001$, $d = 0.53$, $CI_{95\%}$ [0.30, 0.77], were both blamed more than the target using opioids for physical pain. Also, the target using opioids for recreation was blamed more than the target using opioids for emotional pain, $t(289) = 5.16$, $p < .001$, $d = 0.61$, $CI_{95\%}$ [0.37, 0.84].

Desired Social Distance. Desired social distance differed by vignette condition, $F(2, 436) = 49.01$, $p < .001$, $\eta^2 = .18$, $CI_{90\%}$ [.13, .24]. Desired social distance from targets using opioids both for recreation, $t(289) = 9.63$, $p < .001$, $d = 1.13$, $CI_{95\%}$ [0.88, 1.38], and for

emotional pain $t(294) = 6.05$, $p < .001$, $d = 0.70$, $CI_{95\%}$ [0.47, 0.94], was greater than that from targets using opioids for physical pain. Desired social distance from the target using opioids for recreation was also greater than that from the target using opioids for emotional pain, $t(289) = 3.73$, $p = .001$, $d = 0.44$, $CI_{95\%}$ [0.21, 0.67].

Mediation Analyses. Next, we conducted a simultaneous mediation analysis using the *lavaan* package (Rosseel, 2012) for each pairwise comparison to test a model wherein attenuated positivity impressions and/or amplified blameworthiness attributions mediate(s) opioid use origin effects on desired social distance. We used a component approach, which requires the joint significance of both paths of an indirect effect—from independent variable to mediator (*a* path) and from mediator to dependent variable (*b* path)—to conclude the presence of mediation (Yzerbyt et al., 2018). For completeness, we also report all indirect effects (*ab* paths), all total effects (*c* paths), and all direct effects when accounting for the mediators (*c*' paths). We report unstandardized coefficients and $CI_{95\%}$. We used Monte Carlo resampling with 10,000 simulations to estimate each indirect effect and to calculate the corresponding $CI_{95\%}$.

Opioids-for-Physical Pain vs. Opioids-for-Recreation Comparison. Significant indirect effects emerged through positivity impressions (a_1 path: $b = 1.51$, $CI_{95\%}$ [1.29, 1.73], $p < .001$; b_1 path: $b = -0.31$, $CI_{95\%}$ [-0.38, -0.25], $p < .001$; ab_1 path: $b = -0.47$, $CI_{95\%}$ [-0.57, -0.36], $p < .001$) and blameworthiness attributions (a_2 path: $b = -1.65$, $CI_{95\%}$ [-1.98, -1.33], $p < .001$; b_2 path: $b = 0.07$, $CI_{95\%}$ [0.03, 0.12], $p = .002$; ab_2 path: $b = -0.12$, $CI_{95\%}$ [-0.21, -0.04], $p = .004$). The total effect was significant (*c* path: $b = -0.70$, $CI_{95\%}$ [-0.83, -0.56], $p < .001$), but the direct effect became non-significant when accounting for the mediators (c' path: $b = -0.11$, $CI_{95\%}$ [-0.28, 0.06], $p = .199$). Thus, both attenuated positivity impressions and amplified blameworthiness

attributions helped explain the greater desired social distance from the target using opioids for recreation versus the target using opioids for physical pain (see Figure 3, top left panel).

Opioids-for-Physical Pain vs. Opioids-for-Emotional Pain Comparison. Significant indirect effects emerged through positivity impressions (a_1 path: $b = 0.87$, $CI_{95\%}$ [0.66, 1.09], $p < .001$; b_1 path: $b = -0.31$, $CI_{95\%}$ [-0.38, -0.25], $p < .001$; ab_1 path: $b = -0.27$, $CI_{95\%}$ [-0.37, -0.19], $p < .001$) and blameworthiness attributions (a_2 path: $b = -0.80$, $CI_{95\%}$ [-1.14, -0.46], $p < .001$; b_2 path: $b = 0.09$, $CI_{95\%}$ [0.04, 0.13], $p < .001$; ab_2 path: $b = -0.07$, $CI_{95\%}$ [-0.12, -0.03], $p = .005$). The total effect was significant (c path: $b = -0.44$, $CI_{95\%}$ [-0.59, -0.30], $p < .001$), but the direct effect became non-significant (c' path: $b = -0.10$, $CI_{95\%}$ [-0.24, 0.03], $p = .130$). Thus, both attenuated positivity impressions and amplified blameworthiness attributions helped explain the greater desired social distance from the target using opioids for emotional pain versus the target using opioids for physical pain (see Figure 3, top right panel).

Opioids-for-Emotional Pain vs. Opioids-for-Recreation Comparison. A significant indirect effect emerged through positivity impressions (a_1 path: $b = 0.63$, $CI_{95\%}$ [0.40, 0.85], $p < .001$; b_1 path: $b = -0.33$, $CI_{95\%}$ [-0.40, -0.27], $p < .001$; ab_1 path: $b = -0.21$, $CI_{95\%}$ [-0.30, -0.13], $p < .001$). The component approach criteria for mediation via blameworthiness attributions were satisfied (a_2 path: $b = -0.85$, $CI_{95\%}$ [-1.16, -0.53], $p < .001$; b_2 path: $b = 0.05$, $CI_{95\%}$ [0.003, 0.10], $p = .036$); however, the indirect effect itself was not significant (ab_2 path: $b = -0.04$, $CI_{95\%}$ [-0.09, 0.00], $p = .057$). The total effect was significant (c path: $b = -0.25$, $CI_{95\%}$ [-0.38, -0.12], $p < .001$), but the direct effect became non-significant (c' path: $b = 0.00$, $CI_{95\%}$ [-0.11, 0.11], $p = .969$). Thus, attenuated positivity impressions and, to a lesser extent, amplified blameworthiness attributions helped explain the greater desired social distance from the target using opioids for recreation versus the target using opioids for emotional pain (see Figure 3, bottom panel).

Summary. Overall, positivity impressions and blameworthiness attributions both helped explain opioid use origin effects on desired social distance. The strongest effects emerged when comparing the use of opioids for managing physical pain relative to other reasons. Participants desired less social distance from targets using opioids for physical pain than from targets using opioids for emotional pain or for recreation. And attenuated positivity impressions helped explain the greater desired social distance from targets using opioids for recreation versus targets using opioids for emotional pain. Thus, participants differentiated physical pain-related opioid use from other types of opioid use. They also distinguished emotional pain-related use from recreational use, though the indirect effect through blameworthiness attributions fell short of significance. Emotional pain as a justification for opioid use might elicit some compassion as well as some skepticism and blame. Additional psychological mechanisms may more fully explain how participants distinguish between opioid use for emotional pain and recreation.

Profile-Assessment Phase

Analysis Strategy. Using the *lme4* (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2017) packages, we fit linear mixed-effects model for trustworthiness impressions and desired social distance. For both models, we began with the maximal random-effects structure (Barr et al., 2013) and progressively simplified the structure to ensure model convergence. The final models contained a fixed effect for vignette condition and random intercepts for profile generators and profile raters.[6] Following Snijders and Bosker (2012), we calculated η_p^2 by comparing the full mixed-effects model to an intercept-only model. Because profiles were nested within both generators and raters, we used Correll et al.'s (2022) flexible estimation procedure

[6] We identified 12 profiles that were inadvertently included in two different randomized sets of profiles shown to participants. Thus, we randomly selected one set of ratings to retain for each duplicated profile, ensuring that each profile contributed equally to the dataset and preventing disproportionate influence of the duplicated profiles.

for crossed random factors and computed bootstrapped $CI_{95\%}$. Figure 4 displays the pattern of means for each outcome variable. Table S2 displays descriptive statistics for all conditions.

Trustworthiness Impressions. Trustworthiness varied by vignette condition, $F(2, 399.38) = 33.09$, $p < .001$, $\eta_p^2 = .04$, $CI_{90\%}$ [.03, .07]. Profiles of targets using opioids for physical pain were rated as more trustworthy than profiles of targets using opioids for recreation, $b = 0.78$, $CI_{95\%}$ [0.59, 0.97], $t(400.17) = 7.97$, $p < .001$. Similarly, profiles of targets using opioids for emotional pain were rated as more trustworthy than profiles of targets using opioids for recreation, $b = 0.51$, $CI_{95\%}$ [0.32, 0.69], $t(398.19) = 5.35$, $p < .001$. Moreover, profiles of targets using opioids for emotional pain were rated as less trustworthy than profiles of targets using opioids for physical pain, $b = -0.27$, $CI_{95\%}$ [-0.46, -0.08], $t(399.86) = 2.81$, $p = .005$.

Desired Social Distance. There was a significant effect of vignette condition on desired social distance, $F(2, 394.38) = 21.48$, $p < .001$, $\eta_p^2 = .03$, $CI_{90\%}$ [.01, .03]. Desired distance from profiles of targets using opioids for recreation was greater than that from profiles of targets using opioids for physical pain, $b = 0.34$, $CI_{95\%}$ [0.24, 0.44], $t(395.19) = 6.45$, $p < .001$, and for emotional pain, $b = 0.18$, $CI_{95\%}$ [0.08, 0.28], $t(394.83) = 3.50$, $p < .001$. Desired social distance from profiles of targets using opioids for emotional pain was greater than that from profiles of targets using opioids for physical pain, $b = 0.16$, $CI_{95\%}$ [0.06, 0.26], $t(393.19) = 3.20$, $p = .002$.

Profile Generator–Rater Correspondence. Finally, we examined the relation between (a) profile generators' trustworthiness impressions of and desired social distance from the targets and (b) profile raters' trustworthiness impressions of and desired social distance from the profiles of those same targets. Medium-sized positive correlations emerged for trustworthiness, $r(409) = 0.47$, $CI_{95\%}$ [0.40, 0.55], $p < .001$, and desired social distance, $r(409) = 0.38$, $CI_{95\%}$ [0.29, 0.46], p

< .001. Together, these results suggest moderate correspondence between profile generators' and profile raters' trustworthiness impressions of and desired social distance from targets.

Discussion

People using opioids recreationally were again viewed less favorably than those using opioids for physical pain—they were seen as more dangerous and criminal, less trustworthy and moral, and less likely to recover from addiction than all other targets. They were also blamed the most for their addiction and evoked the most desired social distance. These findings align with evidence that recreational drug use, especially opioid use, is highly stigmatized (Forstmann & Sagioglou, 2025; Sattler et al., 2017).

Notably, targets using opioids for emotional pain were viewed less favorably than those using opioids for physical pain, but more favorably than those using opioids recreationally. Thus, the perceived legitimacy and/or legality of opioid use might guide impressions, with physical pain potentially being seen as a more valid reason for opioid use than emotional pain. That using opioids for emotional pain was viewed more favorably than recreational use, however, suggests that using opioids to cope with any form of pain—whether physical or emotional—may be considered more acceptable than using opioids recreationally.

Both positivity impressions and blameworthiness attributions helped explain the greater desired social distance from targets using opioids recreationally or for emotional pain versus for physical pain. Attenuated positivity impressions also helped explain opioid use origin effects on desired social distance when comparing targets using opioids for emotional pain versus recreation, whereas blameworthiness attributions played a less consistent role. Thus, differences in desired social distance from targets who began using opioids for different reasons are driven,

in part, by differing impressions of positivity and blameworthiness attributions. However, additional psychological processes also likely shape judgments of various types of opioid use.

Finally, there was moderate overlap between profile generators' impressions and profile raters' impressions of the former's profiles. This correspondence suggests that both spontaneous and deliberate impressions of people who use opioids are sensitive to the origin of their use.

Experiment 3

Experiment 3 aimed to isolate the role of legality. We tested whether desired social distance from people obtaining opioids illegally without a prescription is greater than that from people obtaining opioids legally with a prescription for the same underlying pain condition.

Method

Participants

We set a target sample size of 250 participants, which affords ≥80% power to detect the smallest effect of vignette condition on blameworthiness attributions and desired social distance obtained in Experiment 4.[7] In total, 258 adults participated for pay. We excluded data from participants who did not complete the entire survey (n = 31) or failed the attention check (n = 24). The final sample comprised 203 participants, which afforded ≥80% power to detect effects as small as d = 0.40 in an independent-samples t-test (Faul et al., 2007). The preregistration for this experiment can be found here: https://aspredicted.org/bq98-f6jt.pdf.

Procedure

Participants were randomly assigned to read one of two vignettes describing a target who began using opioids to manage severe chronic pain. All participants first read:

> Several months ago, [redacted] was walking to a nearby coffee shop and was struck in the leg by a speeding car that ran a red light, instantly resulting in a severe break.

[7] Experiment 3 was conducted after Experiment 4; thus, we used Experiment 4's results for sample size planning in Experiment 3.

In the legal-opioids condition, participants then read:

> To cope with the excruciating pain, [redacted] started taking opioids that were legally prescribed by a physician. Since that time, [redacted] has continued using opioids regularly, even as the pain subsided, eventually developing an addiction.

In the illegal-opioids condition, participants instead read:

> To cope with the excruciating pain, [redacted] started taking opioids, but was unable to obtain a legal prescription from a physician. Since that time, [redacted] has continued using opioids regularly, even as the pain subsided, eventually developing an addiction.

Next, participants completed an eight-item attributions for addiction measure[8] assessing responsibility, controllability, perceived fault, locus of control, and intentionality (e.g., "To what extent do you think [redacted] is personally responsible for their opioid addiction?", "To what extent do you think that developing an opioid addiction was within [redacted]'s control?"; all on scales with 1 = *not at all*, 7 = *extremely*). EFA indicated that a one-factor model fit the data best, so we created a composite by averaging all items ($\alpha = .87$). Participants also completed the same social distance scale from Experiment 2 ($\alpha = .82$). Finally, they completed an attention check and reported demographic information.

Results

Blameworthiness Attributions

Blameworthiness attributions were significantly greater in the illegal-opioids condition ($M = 4.86$, $SD = 1.16$) than in the legal-opioids condition ($M = 4.30$, $SD = 1.03$), $t(179.03) = 3.56$, $p < .001$, $d = 0.53$, $CI_{95\%}$ [0.23, 0.83].

Desired Social Distance

[8] We developed this measure of attributions based on five key theoretical constructs of attribution theorizing (Mantler et al., 2003; Shaver, 1985; Weiner et al., 1988): responsibility, controllability, perceived fault, locus of control, and intentionality. This expanded measure built on the three-item scale used in previous experiments.

Unexpectedly, desired social distance did not significantly differ between the illegal-opioids condition (M = 2.05, SD = 0.57) and the legal-opioids condition (M = 1.98, SD = 0.50), $t(180.05) = 0.95$, $p = .345$, $d = 0.14$, $CI_{95\%}$ [-0.15, 0.43]. Thus, the legality of opioid use did not directly affect the desire for social distance from targets.

Mediation Analysis

Despite the absence of a significant total effect of vignette condition on desired social distance, we used the *lavaan* package (Rosseel, 2012) to test whether vignette condition had an indirect effect on desired social distance through blameworthiness attributions (see Rucker et al., 2011). The effect of vignette condition on blameworthiness attributions was significant (*a* path: $b = 0.56$, $CI_{95\%}$ [0.25, 0.86], $p < .001$), and blameworthiness attributions significantly predicted desired social distance (*b* path: $b = 0.17$, $CI_{95\%}$ [0.10, 0.23], $p < .001$), thereby satisfying both criteria of the component approach to mediation (Yzerbyt et al., 2018). The indirect effect was also significant (*ab* path: $b = 0.09$, $CI_{95\%}$ [0.03, 0.16], $p = .005$). Thus, the data were consistent with a model wherein blameworthiness attributions were greater for a target who obtained opioids illegally versus legally, and these amplified blameworthiness attributions, in turn, predicted greater desired social distance.

Discussion

People who (illegally) obtained opioids without a prescription were blamed more for their addiction than were people who (legally) obtained opioids via prescription, despite having the same underlying pain condition. This finding suggests that the perceived legitimacy of opioid use shapes target impressions independent of the reason for their use by signaling whether it is institutionally sanctioned. Although legality affected blameworthiness attributions, desired social distance did not significantly differ based on whether targets obtained opioids via prescribed or

non-prescribed means. Importantly, however, legality indirectly influenced desired social distance through blameworthiness attributions. The disconnect between the total and indirect effects suggests nuance in how the legitimacy of opioid acquisition shapes person impressions.

Experiment 4

Experiment 4 addressed limitations of Experiments 2 and 3 by directly manipulating blameworthiness attributions. Although these experiments provided correlational evidence linking blameworthiness attributions to desired social distance, their designs preclude causal claims (Bullock et al., 2010; Fiedler et al., 2011; Spencer et al., 2005). Thus, we conducted a causal test of this mediational path. Whereas Experiments 1–3 varied opioid use origin, Experiment 4 held this factor constant across conditions. All participants read about someone using prescribed opioids for physical pain. We experimentally manipulated the target's behavior, depicting them as more versus less blameworthy for their addiction, allowing us to test the effect of blameworthiness attributions on desired social distance via an experimental-causal-chain (Spencer et al., 2005) and thereby address limitations of correlation-based mediation analyses.

Method

Participants

In a pilot study ($N = 117$), we validated the efficacy of our blameworthiness manipulation in shifting attributions for addiction ($d = 0.80$, $CI_{95\%}$ [0.42, 1.18]; see the Supplemental Materials for details). A power analysis using the lower bound of the effect size confidence interval suggested a sample size of 180 participants for 80% power. Anticipating exclusions and allowing for the fact that the effect of the blameworthiness manipulation might be smaller on desired social distance than on what amounted to a manipulation check in the pilot study, we set a target sample size of 250 participants. In total, 263 adults participated for pay. We excluded data from

participants who did not complete the entire study (n = 22) or failed the attention check (n = 11). Our final sample comprised 230 participants, which afforded ≥80% power to detect effects as small as d = 0.38 in an independent-samples t-test (Faul et al., 2007).

Procedure

Participants were randomly assigned to read one of two vignettes describing a target person who had been addicted to opioids for five years. In both vignettes, the target began using opioids after receiving a prescription from a doctor to manage chronic pain from severe injuries sustained in a car accident. In the low-blameworthiness condition, the target was described charitably: They followed their doctor's instructions, attempted alternative pain management methods, sought help for addiction, and acknowledged the negative impacts of their actions. In the high-blameworthiness condition, the target was described less charitably: They ignored their doctor's warnings, dismissed alternative pain management options, refused help for addiction, and denied the negative impacts of their actions. A pilot study confirmed the efficacy of this manipulation in shifting blameworthiness attributions (see Supplemental Materials for details).

After reading the vignette, participants completed the same desired social distance scale from Experiments 2 and 3 (α = .90). Finally, participants completed an attention check by answering a question about the content of the vignette that they had read and reported demographic information.

Results

Desired social distance from the target was greater in the high-blameworthiness condition (M = 2.28, SD = 0.66) than in the low-blameworthiness condition (M = 1.68, SD = 0.63), $t(226.85) = -7.07$, $p < .001$, $d = -0.93$, $CI_{95\%}$ [-1.20, -0.66].

Discussion

Experiment 4 provided causal evidence that blameworthiness attributions increase desired social distance. Unlike the prior experiments, here we held opioid use origin constant while portraying targets as high or low in blameworthiness for their addiction, which allowed us to isolate its effect on desired social distance. Desired social distance was greater when blameworthiness was high versus low, despite the initial reason for opioid use being identical. Thus, blameworthiness can heighten stigma toward people whose opioid use began for "legitimate" reasons (i.e., obtaining a prescription for a medical purpose).

General Discussion

Four experiments using multiple methods investigated how the origin of a person's opioid use shapes impressions of them. Across experiments, three key patterns emerged, each suggesting that such impressions are origin-sensitive. First, people who began using opioids recreationally were viewed less favorably than those whose use initially served to relieve physical or emotional pain. This pattern may reflect differences in the perceived legitimacy of opioid use (i.e., its acceptability based on societal norms, expectations, and values; Suchman, 1995). Using opioids to manage physical pain is normative, whereas using recreationally is not, making it less legitimate by comparison and eliciting greater stigma (Goodyear & Chavanne, 2021; McGinty et al., 2015). Opioid use for emotional pain relief may fall in between: as more legitimate than recreational use but not fully aligned with norms of medical-only use. Nonetheless, people do seem to grant some leniency to opioid use for emotional pain, viewing it as a more justified reason for deviating from societal norms than recreation.

Second, the perceived legitimacy of initial opioid use appears to have guided people's impressions: Coping with emotional pain was seen as more legitimate than recreation but less legitimate than managing physical pain. This pattern aligns with prior work on mental health

stigma showing that conditions deemed less controllable elicit less stigma than conditions deemed matters of personal choice (Corrigan et al., 2003; Link et al., 1999).

Third, both positivity impressions and blameworthiness attributions mediated the effect of opioid use origin on desired social distance. People who began using opioids to manage physical pain were viewed more favorably and as less blameworthy for their use, which, in turn, predicted less desired social distance. Moreover, the perceived legitimacy of opioid attainment (legally prescribed vs. illegally acquired) shaped blameworthiness attributions even when the underlying precipitating event (i.e., severe injury) was identical. Finally, drawing on attribution theories of stigma (Weiner et al., 1988), we provided causal evidence that stronger blameworthiness attributions increased desired social distance, even when holding the initial (legitimate) reason for opioid use constant.

Theoretical and Practical Implications

This work advances theoretical understanding of substance use stigma in several ways. First, multiple pathways contributed to stigma: Both positivity impressions and blameworthiness attributions predicted desired social distance, consistent with multi-component models of stigma (Link & Phelan, 2001). Second, stigma toward people who use opioids varied based on how their use originated, extending prior work on substance *type* as a determinant of stigma (Krendl & Perry, 2023) and highlighting the role of contextual factors. Third, blameworthiness attributions increased desired social distance, consistent with the attribution-affect-behavior model (Weiner et al., 1988). When opioid use stems from (putatively) controllable behavior, negative impressions drive behavioral intentions. Overall, then, this research contributes to a nuanced understanding of impressions of an understudied stigmatized group.

Furthermore, these findings can be understood by bridging two theoretical traditions. Attribution theorizing clarifies how blameworthiness judgments can vary based on opioid use origin and shape stigma (Weiner et al., 1988). Additionally, moral typecasting theorizing, though not directly tested here, illuminates how opioid use origin could inform whether people are encoded as moral patients enduring circumstances beyond their control or as moral agents responsible for their choices (Gray & Wegner, 2009). For example, people using opioids for physical pain might be deemed moral patients—their use is institutionally sanctioned and their suffering is externally validated—leading to high perceived legitimacy. People using opioids recreationally, by contrast, might be deemed moral agents—their use is not institutionally sanctioned, suggesting intentional action—leading to low perceived legitimacy. Opioid use for emotional pain could reflect moderate legitimacy, whereby perceivers acknowledge the target's suffering but recognize the lack of institutional approval for their use. Thus, using opioids for emotional pain could occupy an ambiguous intermediate territory. Together, these theoretical traditions can accommodate the legitimacy continuum observed here, thereby enriching our understanding of the processes underlying origin-sensitive stigma.

This research also has important practical implications. Because people who use opioids are differentially stigmatized based on the origin of their use, anti-stigma campaigns may need to be tailored to different subgroups. Notably, our causal finding that dampened blameworthiness attributions decreased desired social distance suggests a possible intervention target: messaging that shifts attributions for addiction away from individuals. For example, highlighting the pharmaceutical industry's morally agentic role in marketing certain opioids as safe and non-addictive could attenuate attributions of blameworthiness to people who become addicted to opioids, possibly reducing stigma (Weiner, 1993).

That people who began using opioids recreationally faced heightened stigma suggests that they may be reluctant to seek or receive treatment and thereby experience negative health outcomes, especially if they internalize this stigma (Birtel et al., 2017; Earnshaw, 2020). Additionally, emotional pain was viewed as a more blameworthy reason for initial opioid use than physical pain, suggesting that people whose opioid use began to cope with hardship may face stigma despite having valid needs. Healthcare providers should be aware of how origin effects could bias their own responses and treatment recommendations.

Strengths, Limitations, and Future Research Directions

Multiple methodological features strengthen our findings. By assessing both deliberate and spontaneous impressions, we reduced the likelihood that our results merely reflect social desirability. The consistency of our results across self-reported ratings and a profile-generation-and-assessment paradigm attests to the robustness of origin effects on social impressions. The moderate correlations between profile generators' and raters' impressions helps validate this approach, while also suggesting that these impressions are not fully redundant with each other.

Importantly, our experimental approach to testing mediation established causal evidence that blameworthiness attributions increased desired social distance. By manipulating blameworthiness attributions while holding opioid use origin constant, Experiment 4 documented a causal chain linking opioid use origin to desired social distance through blameworthiness. That is, rather than relying on correlational techniques to support a *causal* model, we manipulated the proposed mediator and observed its effects on the outcome variable (Spencer et al., 2005), thereby providing more robust evidence for our theoretical model.

Despite establishing causal evidence for a mediational pathway from blameworthiness attributions to desired social distance, our blameworthiness manipulation (though validated in a

pilot study; see Supplemental Materials) was not selective in altering *only* blameworthiness. Indeed, it is unclear which aspect(s) of blameworthiness (e.g., ignoring their doctor's warnings about addiction potential, dismissing alternative pain management options, refusing help for addiction) might be driving the results.

Experiment 4 also cannot rule out the reverse causal pathway from desired social distance to blameworthiness. This directionality would align with motivated-reasoning accounts, wherein perceivers distance themselves based on group membership (e.g., "recreational drug user") and attribute blame to justify their avoidance (e.g., Alicke, 2000). Future research could test this complementary pathway by manipulating approach–avoidance motivations before assessing attributions. Future work would also benefit from exploring other mechanisms identified in the stigma literature (e.g., unpredictability; Corrigan et al., 2003), with the aim of providing a more complete understanding of the mechanisms underlying substance use stigma.

Several other limitations merit consideration. These experiments drew entirely from online convenience samples of participants from the United States, which necessarily constrains the generality of our findings. Despite taking several steps to ensure data quality (Hauser et al., 2023), the reported findings might only reflect impressions held by this specific participant population. Although participants did report some familiarity with opioids, these samples may not capture the views of people whose impressions most directly affect people with opioid use disorders (e.g., family members, healthcare providers, law enforcement). Additionally, our findings may not generalize to other substances or to societies where opioid use is less prevalent or carries different cultural connotations.

Furthermore, we primarily used self-reported measures of stigma (e.g., social distance scales, trait ratings), which may diverge from in-the-moment reactions to people who use

opioids. We also did not test whether participants' personal experiences with opioid use shapes stigma. People with personal histories or affected loved ones may hold different origin-sensitive impressions, potentially amplifying or attenuating differentiation between use origins.

We had participants form impressions of hypothetical targets described in brief vignettes, which may not reflect the complexity of impression formation in real-life interpersonal contexts. These gender-neutral vignettes did not allow us to examine how gender and other demographic characteristics (e.g., age, race/ethnicity) might interact with opioid use origin in shaping stigma. Indeed, substance use stigma varies by target gender (Wirth & Bodenhausen, 2009); thus, future work will be needed to determine if origin effects on stigma also differ by target gender.

A related avenue for future study is testing if appearance-based characteristics affect assumptions about why someone initially began using opioids. Such work could explore if people infer certain underlying motives for using opioids (e.g., alleviating pain vs. getting high) based on targets' appearance or intersecting demographic characteristics (Kulesza et al., 2016) and if such assumptions affect the care people receive.

Looking ahead, many other questions remain. Do origin effects generalize to substances besides opioids? Given evidence that different substances elicit differential stigma (Forstmann & Sagioglou, 2025; Krendl & Perry, 2023), origin effects could vary by substance type. What interventions most effectively reduce origin-based stigma? Contact-based strategies have shown promise for reducing mental illness stigma (Corrigan et al., 2012), but they may require tailored modifications to address origin-specific stereotypes. Further clarifying how opioid use origin shapes person impressions could also inform interventions targeting attributional mechanisms like those identified here. Finally, how do origin effects interact with structural factors (e.g., healthcare access) in shaping stigma and treatment outcomes?

Conclusion

Impressions of people who use opioids depend on how their use originated. Understanding this nuance, alongside its underlying mechanisms, provides insight into substance use stigma, with implications for identifying barriers to treatment. Future work examining ways to reduce origin-based stigma could ensure more equitable access to treatment and recovery resources, potentially improving outcomes for this population.

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Table 1

Participant Demographics (Experiments 1–4)

		Age		Gender (%)			Race/Ethnicity (%)						
Experiment	*N*	*M*	*SD*	Women	Men	Nb	A	B	L	Me	Mx	Na	W
1	363	40.4	11.9	56.7	41.3	0.8	4.7	10.2	4.1	0.6	1.9	1.4	75.8
2 (PG)	439	41.0	12.8	61.7	36.2	1.6	4.6	10.0	6.2	0.7	2.7	0.7	73.3
2 (PA)	316	43.4	12.8	52.2	45.6	0.3	6.0	9.81	2.9	0.0	5.1	0.6	73.1
3	203	42.3	12.4	40.4	56.6	1.5	5.4	8.9	3.5	0.0	3.5	1.0	74.4
4	230	41.2	12.0	49.6	48.7	0.9	6.1	7.4	4.3	0.0	1.7	0.0	80.4

Note. For Experiment, PG = profile-generation phase, PA = profile-assessment phase. N = number of participants included in analyses. For gender, Nb = nonbinary. For race/ethnicity, A = Asian, Asian American, or Pacific Islander, B = Black or African American, L = Latina/o/e/x or Hispanic, Me = Middle Eastern or North African, Mx = reported another or more than one race/ethnicity, Na = Native American, and W = White or European American. Some participants did not report their gender or race/ethnicity.

Table 2

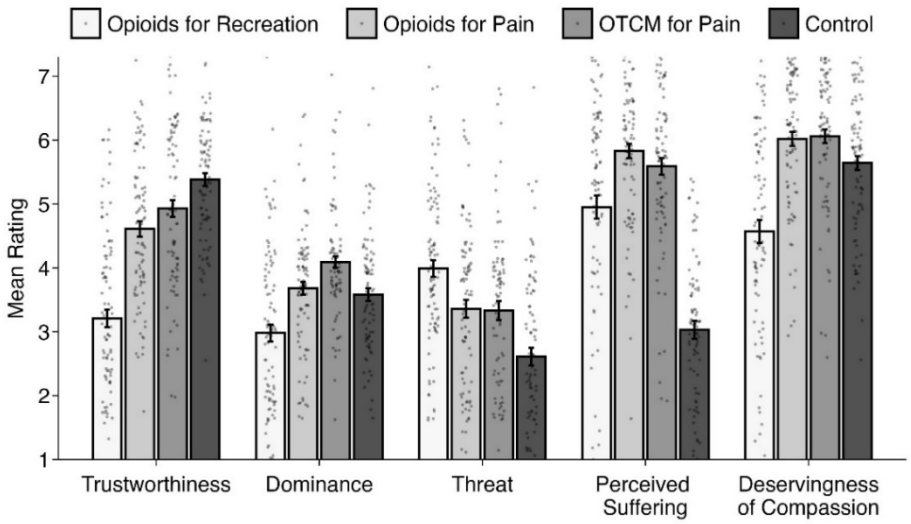
The Five Most Frequently Listed Adjectives by Vignette Condition (Experiment 2, Phase 1)

Opioids for Recreation	Opioids for Emotional Pain	Opioids for Physical Pain
depressed (19.72%)	sad (40.69%)	desperate (22.07%)
sad (16.90%)	depressed (31.72%)	sad (15.17%)
reckless (16.20%)	weak (22.07%)	hurt (11.72%)
irresponsible (12.68%)	desperate (22.00%)	hurting (11.72%)
bored (11.27%)	lonely (14.48%)	pain (11.72%)

Note. Values in parentheses reflect the percentage of profile generators in that condition who listed the adjective.

Figure 1

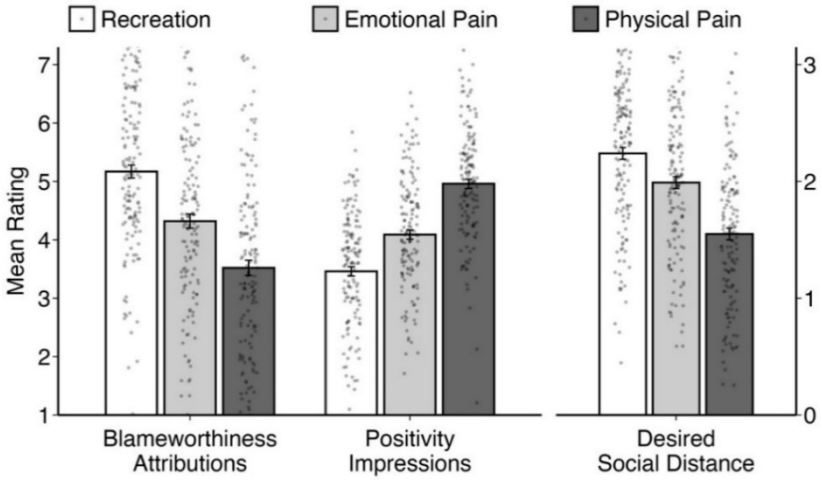
Impressions of Trustworthiness, Dominance, Threat, Perceived Suffering, and Deservingness of Compassion by Vignette Condition (Experiment 1)



Note. Error bars depict standard errors. OTCM = over-the-counter medication.

Figure 2

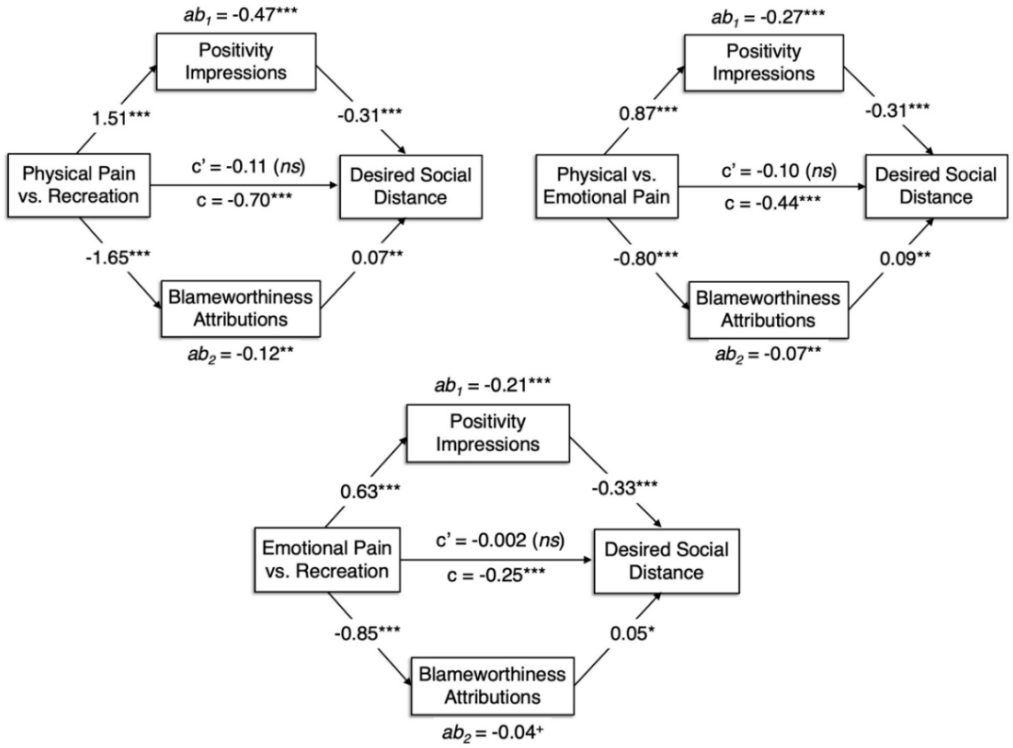
Positivity Impressions, Blameworthiness Attributions, and Desired Social Distance by Vignette Condition (Experiment 2, Phase 1)



Note. Error bars depict standard errors.

Figure 3

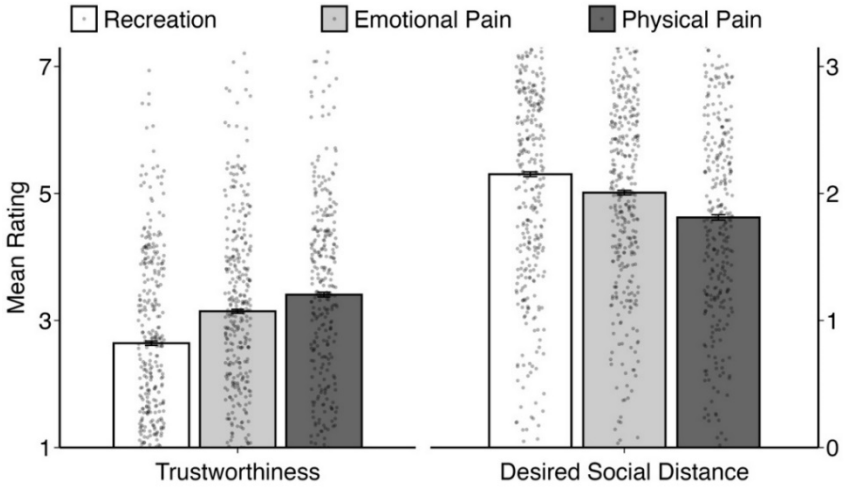
Desired Social Distance Mediation Models (Experiment 2)



Note. * $p < .05$. ** $p < .01$. *** $p < .001$. *ns* = not significant.

Figure 4

Trustworthiness Impressions and Desired Social Distance by Vignette Condition (Experiment 2, Phase 2)



Note. Error bars depict standard errors.