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Opioid use and stigma: the role of gender, language and precipitating events

Kimberly Goodyear^{1,2}, Carolina L. Haass-Koffler^{1,2,3}, and David Chavanne⁴

¹Center for Alcohol and Addiction Studies, Department of Behavioral and Social Science, Brown University, Providence, RI, USA

²Section on Clinical Psychoneuroendocrinology and Neuropsychopharmacology, National Institute on Alcohol Abuse and Alcoholism; and National Institute on Drug Abuse, National Institutes of Health, Bethesda, MD, USA

³Center for Alcohol and Addiction Studies, Department of Psychiatry and Human Behavior, Brown University, Providence, RI, USA

⁴Department of Economics, Connecticut College, New London, CT, USA

Abstract

The stigma of drug addiction is associated with negative perceptions and can be a barrier to treatment. With the rise in opioid overdose deaths, understanding stigmatizing attitudes towards individuals who use opioids is a crucial matter. There is a lack of opioid use research on stigma and, therefore, we aimed to discern stigmatizing attitudes towards people with opioid addiction. A randomized, between-subjects case vignette study ($n = 2,605$) was conducted with a nation-wide online survey. Participants rated a hypothetical individual addicted to opioids on different dimensions of stigma after seeing one version of a vignette that varied by three conditions: 1) a male versus a female, 2) an individual labeled as being a “drug addict” versus having an “opioid use disorder” and 3) an individual whose use started by taking prescription opioids from a friend versus receiving a prescription from a doctor. Our results indicated that there were higher stigmatizing attitudes overall towards a male, an individual labeled as a “drug addict” and an individual who took prescription opioids from a friend. Interaction effects also showed that a female labeled with an “opioid use disorder” and male labeled as a “drug addict” was rated with higher stigma. The findings from our study are the first to show that information about gender,

Correspondence Kimberly Goodyear, Department of Behavioral and Social Sciences, Center for Alcohol and Addiction Studies, Brown, University, Box G-S121-5, Providence, RI 02912, Phone: 401-863-6600, kimberly_goodyear@brown.edu.

Contributors

KG, DC and CLHK contributed to the conception of the design and protocol. KG and DC acquired data for analysis and analyzed data. KG, DC and CLHK contributed to the drafting of the work, revision and approved the final version of the work. All authors have reviewed and approved the final manuscript.

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Authors Disclosures

Conflict of Interest

No conflict declared

precipitating events and language matter when assessing stigma and opioid use and may affect the delivery of patient care.

Keywords

Opioids; Stigma; Opioid Use Disorder; Nonmedical Prescriptions; Gender; Language

1. Introduction

The opioid epidemic in the United States is a growing public health concern. Since 1999, the sales of prescription opioids have nearly quadrupled (Frenk et al., 2015), as has the number of overdose deaths from prescription opioids (CDC, 2016). In 2015, 91 individuals a day died from an opioid overdose (including prescription opioids and heroin), totaling to more than 33,000 deaths (Rudd et al., 2016).

The increase in prescriptions for opioids has been attributed to a number of factors such as new standards for appropriate pain control management, liberalizing laws for opioid prescriptions to treat non-cancer chronic pain from state medical boards in the 1990's (Kenan et al., 2012; Kuehn, 2007; Manchikanti et al., 2010) and, the marketing and promotion of opioids from pharmaceutical companies to doctors, minimizing the risk of addiction to opioids (Van Zee, 2009). In addition, pain management clinics are inappropriately prescribing/distributing drugs, labeled as, "pill mills", may in part have contributed to the proliferation of overprescribed opioids (Rigg et al., 2010). Despite the minimization of the addictive properties of opioids, both research and clinical practice have shown that repeated use of opioids can affect brain connectivity and function that lead to severe consequences such as physical dependence and chronic addiction (Volkow and McLellan, 2016).

In spite of the prevalence of nonmedical opioid use, however, there remain barriers to receiving treatment (e.g., lack of health coverage, costs of treatment) after developing an opioid addiction. In 2016, more than 2 million Americans had an opioid use disorder, but a little more than 20% of individuals had received treatment for opioid addiction (SAMHSA, 2017b). The lack of individuals receiving treatment for opioid use points to the importance of understanding such barriers, one of which is the stigmatization of individuals with an opioid use disorder. Stigma is a multidimensional construct that can be in the form of an attitude, an attribute or characteristic, or a shared belief about a behavior (Crocker et al., 1998; Goffman, 1963; Stafford and Scott, 1986) and can manifest in different ways. Self-stigma is an internalized negative belief that individuals hold about themselves, while public stigma refers to the negative beliefs of the public toward a person or group (Corrigan and Watson, 2002). Perceived stigma is an internalized negative belief that others have a commonly held stereotype about a stigmatized group. Perceived stigma is associated with higher internalized shame and can be a barrier for individuals to enter treatment (Luoma et al., 2010). Stigma can lead to fear and social isolation and may deter individuals from seeking treatment and/or help and can impact the way treatment providers interact with someone with a substance use disorder (Botticelli and Koh, 2016). For example, it has been

demonstrated that healthcare professionals commonly have negative attitudes towards individuals with a substance use disorder, which can contribute to lower quality of care that these individuals receive (Van Boekel et al., 2013). Furthermore, the effect of language on stigmatizing attitudes in two studies showed that when an individual is referred to as a “substance abuser” compared to having a “substance use disorder”, healthcare providers judged the substance abuser as less deserving of treatment (Kelly, 2004) and more culpable and deserving of punitive action (Kelly and Westerhoff, 2010).

Stigmatizing individuals with an opioid use disorder or other substance use disorders can lead to stereotyping, labeling, prejudice, and discrimination. For instance, previous research has shown that public attitudes towards drug addictions are more stigmatized than mental illnesses (Barry et al., 2014) and individuals with a substance use disorder may be perceived as having control over their illness and, therefore, being more responsible for their behaviors (Corrigan et al., 2009). Moreover, prescription opioids can be obtained legally from a medical doctor, and in some cases, addiction can develop from repeated opioid use (Kolodny et al., 2015). Individuals who obtain an opioid prescription from a doctor may have “less control” over the development of an addiction and may be held less responsible for their behaviors. Therefore, individuals who use opioids compared to other substances may be stigmatized differently, and improving public policies through the use of communication strategies (e.g., highlighting individual stories with contextual information) should be considered (McGinty et al., 2017). It has recently been shown that higher stigma towards individuals with an opioid use disorder was associated with greater public support for punitive policies and lower support for health-oriented policies such as increasing government spending (Kennedy-Hendricks et al., 2017). While their results provide evidence for policy implications, whether these results can be attributed to individual factors (e.g., taking opioids from someone) or system factors (e.g., prescribing practices) is unknown. Therefore, we aimed to understand public stigma towards an opioid addiction by comparing individual and system factors.

Although it has been previously reported that rates of nonmedical prescription opioid use are greater among men, there are no differences in the occurrences of opioid use disorder among men and women (Saha et al., 2016). In the past year, it has been estimated that 11% of men and 6% of women received treatment for illicit drug use (SAMHSA, 2017a). The role that gender plays in stigmatizing attitudes towards opioid use has not been thoroughly explored, and only a few studies have investigated gender and drug addiction in the context of stigma. Studies have shown that respondents rated a male with a drug addiction higher for variables such as blame, fear, and anger compared to a female (Sattler et al., 2017) and women were rated with higher negative attributions who used cannabis and methamphetamine compared to men (Sorsdahl et al., 2012). Another recent study investigating implicit and explicit beliefs about persons who inject drugs found that there were no differences between genders, but a higher implicit belief about warranting punishment was found for a person framed as a Latino(a) versus a person framed as White (Kulesza et al., 2016).

The stigmatization of individuals with an addiction can be influenced by many complex factors (Sattler et al., 2017); therefore, we aimed to encompass different characteristics and dimensions involved with stigma (i.e., responsibility, positive and negative effect and

dangerousness). Previously, there has been a focus on stigma research investigating attitudes towards alcohol use (Keyes et al., 2010; Schomerus et al., 2010) and substance use (Corrigan et al., 2009; Luoma et al., 2007; Sattler et al., 2017). A recent study investigated social stigma and social distance (e.g., experience with prescription opioid use disorders) towards individuals with an opioid use disorder (Kennedy-Hendricks et al., 2017). They found that there were higher levels of stigma towards individuals framed as “having an addiction to prescription painkillers” and there was no difference in regards to social distance. These findings provide evidence that there is stigma towards individuals with an opioid use disorder, but *how* the information contributes to public stigma and opioid use needs further exploration. We, therefore, focused on the effect that language, target gender and precipitating events (i.e., how the drug was initially obtained) have on the stigmatization of opioid use. In light of previous research on the role of language in stigmatization, we first looked at stigmatizing attitudes when an individual is labeled as a “drug addict” versus an individual with an “opioid use disorder”. Given the role that gender may play in stigmatizing attitudes and the prevalence of opioid use disorder, we investigated how the gender of an individual with an opioid use disorder affects stigma. Lastly, we wanted to discern whether stigma is affected by information provided about the precipitating events that may contribute or lead to excessive opioid use. We examined an individual who was prescribed opioids from a doctor and an individual who took opioids from a friend. To our knowledge, the role of precipitance has never been studied in the context of opioid use, and in light of the role that overprescribing may have played in exacerbating the opioid epidemic, we sought to uncover the pertinence of precipitance. We used case vignettes to investigate the influence of language, precipitance of obtaining the opioids and gender on stigmatizing attitudes. We hypothesized that there would be greater stigmatizing attitudes (higher responsibility, dangerousness and negative affect and lower positive affect) towards 1) a male versus a female, 2) an individual labeled as a “drug addict” versus having an “opioid use disorder” and 3) an individual who took prescription opioids from a friend versus receiving a prescription from a doctor.

2. Methods

2.1 Participants

Participants were recruited and paid through Amazon’s Mechanical Turk (MTurk; <http://www.mTurk.com>), a crowdsourcing website. MTurk, which has become a popular tool to conduct survey-based research, connects suppliers of basic labor tasks (known as “requesters”) with people who are willing to complete them (known as “workers”) in an online labor market. MTurk workers provide samples that are more representative (Berinsky et al., 2012; Buhrmester et al., 2011; Mason and Suri, 2012) and more diverse geographically and demographically (Strickland and Stoops, 2015) than convenience samples used in traditional academic studies. Further, MTurk has become more prevalent among researchers as a means to investigate variables with clinical relevance (Chandler and Shapiro, 2016) and it has repeatedly been shown that research conducted on MTurk replicates published experimental findings (Berinsky et al., 2012).

To be eligible to participate, participants had to live in the United States and be at least eighteen years old. After accepting the assignment on MTurk, participants were taken to Qualtrics (<https://www.qualtrics.com>), a widely used online management software that is used for collection and analysis of data, where they provided informed consent and were notified that there would be questions mixed in to ensure that they were paying attention. All participants were then randomly assigned to one of eight possible scenarios. After being shown the vignette, they were asked two comprehension questions. All participants who missed either or both of these questions (228 out of 2,833) were eliminated from the analysis, leaving us with a sample of 2,605 participants (92% completed the survey). This study was approved by Connecticut College's Institutional Review Board (IRB).

2.2 Case Vignettes

Each vignette described a hypothetical individual who became addicted to opioids. The vignettes varied based on three conditions: 1) *Target Gender*: male or female, 2) *Language*: “drug addict” or “opioid use disorder”, 3) *Precipitance*: doctor or individual. Table 1 shows an example of a vignette with target gender as female, language-using opioid use disorder and precipitance as a doctor. The descriptions in the vignettes were all the same, except the wording was changed based on the different conditions (see Table S1 for full descriptions)¹. After reading the vignette, participants were asked to rate the individual on an interval scale (e.g., 1–6, where 1 is low, and 6 is extremely) based on four variables: responsibility, dangerousness, positive affect (concern, sympathy) and negative affect (anger, disappointment). The variables were selected based on earlier work that showed that variables such as affect, responsibility (Skinner et al., 2007) and dangerousness (Sattler et al., 2017) might contribute to the stigmatization of others.

2.3 Measures

After responding to the vignette, participants completed demographic measures, substance use history and the Perceived Stigma of Addiction Scale (PSAS) (Luoma et al., 2010), a measure that assesses perceptions of public stigma towards substance users (see Table 2 for descriptive statistics). The PSAS was completed last so it would not influence participant perceptions during the experimental task. Lastly, participants were asked if they knew someone with opioid addiction (i.e., familiarity).

2.4 Statistical Analysis

Data analysis was conducted with the Statistical Package for Social Sciences 24.0 (SPSS 24.0, IBM Corp.) with alpha set to $p < .05$. A one-way analysis of variance (ANOVA) for the PSAS scores and chi-square (χ^2) analyses were conducted for all other measures to assess any differences across scenarios (Table 3). A 2 (*Target Gender*: male versus. female) \times 2 (*Language*: addict versus. disorder) \times 2 (*Precipitance*: doctor versus. individual) multivariate analysis of covariance (MANCOVA) was implemented to investigate stigma attitudes based on positive and negative affect, responsibility and dangerousness. A principal component factor analysis with varimax rotation for the four affect scales (concern, sympathy, anger,

¹Supplementary material can be found by accessing the online version of this paper at <http://dx.doi.org> and by entering doi: ...

and disappointment) was conducted similarly to previous work on stigma (Skinner et al., 2007). Participant's past and current nonmedical prescription opioid use (yes, no) were included as a covariate based on previous findings that showed one's use could influence stigma towards individuals with drug addiction (Sattler et al., 2017). Participants significantly differed on the PSAS score and familiarity (yes, no), and therefore, these measures were entered as additional covariates. Previous studies have demonstrated that normalization procedures are not necessary for large sample sizes (Ghasemi and Zahediasl, 2012; Lumley et al., 2002). Nevertheless, Mann-Whitney U tests were conducted for each factor to reinforce the robustness of our results.

3. Results

3.1 Stigma Attitudes

3.1.1 Responsibility.—There were significant main effects of Language ($F(1, 2594) = 5.11, p = .024$) and Precipitance ($F(1, 2594) = 49.59, p < .0001$), but no significant main effect of Target Gender ($F(1, 2594) = 0.31, p = .577$). For Language, the addict was rated with higher responsibility compared to disorder (Figure 1A), and for precipitance, the individual was rated with higher responsibility than the doctor (Figure 1B). No interaction or covariate effects were found for responsibility (all p 's $> .05$).

Planned follow-up Mann-Whitney U tests showed a significant difference for Language between addict and disorder ($U = 808762.50, p = .036$) and Precipitance between individual and doctor ($U = 679590.50, p < .0001$), but not for Target Gender ($U = 840816.00, p = .687$), which are consistent with the MANOVA results.

3.1.2 Dangerousness.—There was significant main effect of Precipitance ($F(1, 2594) = 6.41, p = .011$) and no main effects of Language ($F(1, 2594) = 1.46, p = .227$) or Target Gender ($F(1, 2594) = 0.01, p = .942$). For Precipitance, individual was rated as more dangerous than doctor (Figure 2A). An interaction effect of Target Gender x Language was found ($F(1, 2594) = 4.96, p = .026$). *Post hoc* analysis showed that disorder was rated as more dangerous than addict within the female condition ($t(1304) = -2.43, p = .015$) (Figure 2B). Lastly, there was a significant covariate effect of opioid use ($F(1, 2594) = 4.97, p = .026$), indicating that individuals with past/current use of opioids had lower dangerous ratings (Figure 2C). No other interaction or covariate effects were found (all p 's $> .05$).

Planned follow-up Mann-Whitney U tests showed a significant difference for Precipitance between individual and doctor ($U = 801962.00, p = .015$), which is consistent with the MANCOVA findings. Target Gender ($U = 845215.50, p = .872$) and Language ($U = 824666.50, p = .230$) were not significant.

3.1.3 Positive Affect.—There were significant main effects of Target Gender ($F(1, 2594) = 4.85, p = .028$) and Precipitance ($F(1, 2594) = 14.71, p < .0001$) and no significant main effect of Language ($F(1, 2594) = 0.90, p = .764$). For Target Gender, female was rated with higher positive affect compared to male (Figure 3A) and for Precipitance, doctor was rated with higher positive affect compared to individual (Figure 3B). There were significant covariate effects for familiarity ($F(1, 2594) = 15.36, p < .0001$), opioid use ($F(1, 2594) =$

7.17, $p = .007$) and total PSAS score ($F(1, 2594) = 22.70, p < .0001$). Familiarity and past/current opioid use were associated with higher positive affect ratings (Figure 3C and 3D). A bivariate Spearman's rho correlation was conducted for the PSAS score and positive affect and the results showed that individuals with a higher PSAS score (higher perceptions of public stigma) had lower positive affect ratings ($r(2603) = -.06, p = .001$). No interaction effects were found for positive affect (all p 's $> .05$).

Planned follow-up Mann-Whitney U tests showed a significant difference for Target Gender between male and female ($U = 808531.50, p = .037$) and Precipitance between individual and doctor ($U = 775245.50, p < .0001$), but not for Language ($U = 832203.00, p = .429$), which is consistent with the MANCOVA results.

3.1.4 Negative Affect.—There were significant main effects of Language ($F(1, 2594) = 4.63, p = .031$) and Precipitance ($F(1, 2594) = 25.68, p < .0001$), but no main effect of Target Gender ($F(1, 2594) = 0.84, p = .359$). For Language, addict was rated with higher negative affect compared to disorder (Figure 4A) and for Precipitance, individual was rated with higher negative affect compared to doctor (Figure 4B). An interaction effect of Target Gender x Language was revealed ($F(1, 2594) = 6.68, p = .010$). *Post hoc* analyses showed that addict was rated with higher negative affect compared to disorder within the male condition ($t(1297) = -3.34, p = .001$) and male was rated with higher negative affect than female in the addict condition ($t(1345) = -2.52, p = .012$) (Figure 4C). There were significant covariate effects for familiarity ($F(1, 2594) = 6.87, p = .009$) and opioid use ($F(1, 2594) = 5.81, p = .016$). Familiarity and past/current opioid use were associated with higher positive affect ratings (Figure 4D and 4E). No other covariate or interaction effects were found (all p 's $> .05$).

Planned follow-up Mann-Whitney U tests showed a significant difference for Language between male and female ($U = 806502.50, p = .033$) and for Precipitance between individual and doctor ($U = 754958.50, p < .0001$), but not for Target Gender ($U = 830725.00, p = .358$), which is consistent with the MANCOVA results.

3.2 Principal Component Factor Analysis

The four affect scales (concern, sympathy, disappointment, and anger) were analyzed with a principal component factor analysis with varimax rotation. Similar to the findings of Skinner et al. (2007), two components with an eigenvalue greater than 1 were found. Anger and disappointment had factors loadings of .85 and .87 and these items were loaded on the first component. Concern and sympathy had factor loadings of .82 and .91 and these items were loaded on the second component. Scores for anger and disappointment were combined for a measure of negative affect and concern and sympathy were combined for a measure of positive effect.

4. Discussion

In this study, we aimed to discern the variables involved with stigmatization of an individual with the opioid addiction. When assessing the role of precipitance, our results illustrate that there were higher stigmatizing attitudes (i.e., responsibility, dangerousness, positive affect

and negative affect) towards an individual who took opioids from a friend (individual factor), compared to an individual who received an opioid prescription from a doctor (system factor), despite the fact that each scenario ended identically. Our findings on precipitance can be explained in terms of the attributional theory of stigma, where the cause of an event or behavior can be inferred as external (situational factors), internal (dispositional or personal characteristics), controllable (e.g., onset of an addiction) and stable (e.g., reversibility of the addiction) (Corrigan, 2000; Sattler et al., 2017; Weiner et al., 1988). When applied to drug addictions, the attributional framework is of particular relevance because the degree of controllability that someone has over their addiction may affect a stigmatizing response to that person (Hegarty and Golden, 2008). A chasm between academics exists on how to define addiction. There are strong proponents of the belief that addiction is a “choice” or a “voluntary behavior” (Levy, 2013), while others argue that addiction is a “brain disease” characterized by a loss of control and compulsive behaviors (Henden et al., 2013; Volkow et al., 2016). In our study, we theorize that participants may have assigned more “controllability” to the individual who took the opioids from a friend compared to the individual who received a prescription from a doctor and therefore, was rated with higher stigma. With the role that overprescribing may have played in the opioid epidemic, this finding provides a better understanding of how information about precipitating events can contribute to stigmatization.

In addition to precipitance, our results indicated that language and gender also play a part in stigmatizing attitudes. We found that an individual labeled as a drug addict had a higher responsibility and negative affect ratings compared to someone with an opioid use disorder, while a male had lower positive affect ratings compared to a female. Our findings are in line with previous studies on substance use that show that males (Sattler et al., 2017) and being labeled as a “substance abuser” (Kelly and Westerhoff, 2010) have higher stigma ratings compared to females and “substance disorder”. We also found an interaction effect that showed that opioid use disorder was rated with higher dangerousness than drug addict within the female condition. In 2013, the 5th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was released with the goal of newer scientific findings on psychiatric disorders becoming more compatible with the newest version of the International Classification of Diseases (ICD-11) (Regier et al., 2013). Hundreds of experts from different disciplines contributed to the DSM-5 and newer classifications such as “opioid use disorder” and “substance use disorder” were added into the manual. However, with the changes in clinical nomenclature, the effect on public perceptions about psychiatric disorders may not have been fully understood. In light of our findings, clinical terminology such as “disorder” needs to be taken into consideration when assessing women with opioid addictions. This interaction result can be looked at in terms of the attribution theory of stigma relating to stability (e.g., reversibility of the addiction). An individual labeled with a disorder potentially could be seen as having a “condition” that may be less reversible than someone labeled as an addict. Furthermore, research has shown that women tend to abuse substances less than men and women may be stigmatized more when using substances because of a violation of gender norms (Hecksher and Hesse, 2009). A woman’s suitability as a “mother or carer” may be in question if she has a drug problem (Toner et al., 2008), which may explain the differences in the dangerousness ratings. In addition, we showed that there were

interaction effects of language and gender on negative affect ratings. When comparing male to female in the drug addict condition, the male was rated with higher negative affect ratings. Within the male condition, drug addict was rated higher with higher negative affect ratings than disorder. A male labeled as a “drug addict” might align with gender expectations of what may be common perceptions of male behavior. Overall, our interaction effects suggest that language matters for both males and females and labeling criteria needs to be further scrutinized.

Lastly, our results indicated that familiarity, participants’ past/current opioid use and PSAS scores might be involved with stigmatization of an individual who uses opioids. Previous research suggests that familiarity of drug addictions (e.g., contact/knowing someone with an addiction or personal experience with drug) can influence stigmatizing attitudes towards someone with a drug addiction (Addison and Thorpe, 2004; Corrigan et al., 2009; Sattler et al., 2017) and our study showed similar results. In addition, we found a negative correlation between the PSAS score and positive affect ratings. Participants with a higher PSAS score (higher perceived perceptions of public stigma) had lower positive affect ratings. Higher perceptions of public stigma may reflect higher internalized stigma or shame (Luoma et al., 2010), which could explain the lower positive affect ratings. However, our PSAS result should be taken speculatively because the phrases in the measure pertain to “substance use” and may reflect general beliefs, rather than specificity towards opioids. Lastly, while our study was open to the public, it was conducted with MTurk and, therefore, our findings may reflect the viewpoints representative of individuals who use MTurk. Our sample was predominantly White, and since opioid use disorder has historically affected White individuals, our results may have been influenced by racial aspects. Nonetheless, our inferential statistics showed that race was not different across each scenario. Future studies should address the role that race has on public attitudes towards individuals who use opioids.

Our study strengths include a nation-wide survey that allowed us to gather information from a large sample size. Also, the survey allowed responders to maintain their anonymity, which ensured private communication, lack of judgment from an interviewer and, therefore, maximized truthful responses. Our study also has a few limitations. First, the PSAS and other measures were given at the end of the study to avoid influencing participants’ perceptions about the experimental task. Second, our addict condition chosen for the task was based on a commonly used lay term to create high external validity. Future studies could vary the language and investigate other commonly used lay terms. Lastly, we aimed to understand the multidimensionality of stigma; however, our factors may not have entirely encompassed this complex construct. Other studies could include more factors to assess any differences in attitudes towards opioid use.

The goal of this study was to have a greater understanding of the stigmatizing attitudes towards opioid use. Our findings add to the existing literature on stigma and drug addiction, while also providing a better foundation for comprehending the influence of factors such as precipitance, gender, and language on the stigmatization of opioid use. These findings are especially salient given the rise in opioid use and opioid overdose deaths. A better discernment of the factors involved with the inception of opioid use and how stigma can negatively impact individuals can potentially shift perspectives on multiple levels (e.g.,

healthcare level and community level) to facilitate policy changes. How healthcare providers and scientists label individuals addicted to opioids create an arena that translates to the community and the media. Therefore, implementing changes on the healthcare and research level can be the first step to changing public attitudes. For instance, knowledge and competency about opioid use disorder, as well as familiarity with addictions, can be increased by providing educational platforms and training to healthcare professionals and researchers. Further, the use of pejorative language should be eliminated (e.g., “addict”), and the recovery process should be promoted (Broyles et al., 2014). In turn, the community and the media can be informed through communication strategies, which could include sympathetic narratives (e.g. humanizing individual experiences and struggles), messages without blame (e.g. emphasizing the role of factors outside of an individual’s control) and messages highlighting structural barriers (e.g. pointing to a lack of insurance coverage for treatment) (McGinty et al., 2017). Increasing public support for policies and raising awareness by providing information to promote change can help to facilitate legislative policy advocacy. While the current study did not directly measure policy implementation, it would be beneficial for future studies to investigate the intersection of policy and stigma.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights

- Gender, language and precipitation matter for stigma and opioid use
- Greater scrutiny is needed for addiction labeling criteria for both genders
- Familiarity with opioid use lowers stigmatizing attitudes

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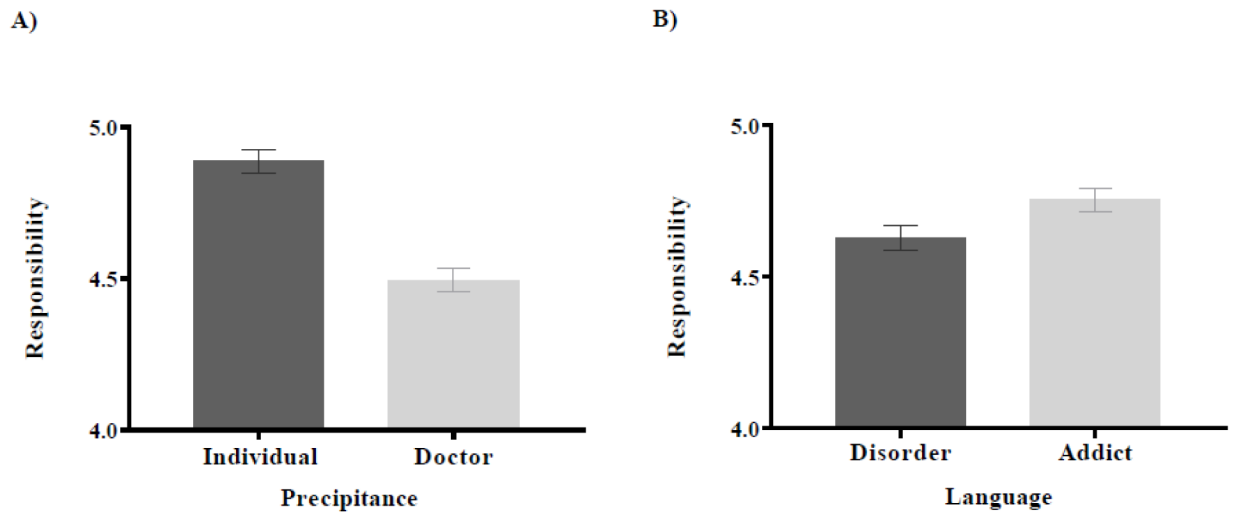


Figure 1. Responsibility.

A) For the main effect of Language, addict was rated with higher responsibility compared to disorder ($p < .0001$). **B)** For the main effect Precipitance, individual was rated with higher responsibility compared to doctor ($p = .024$).

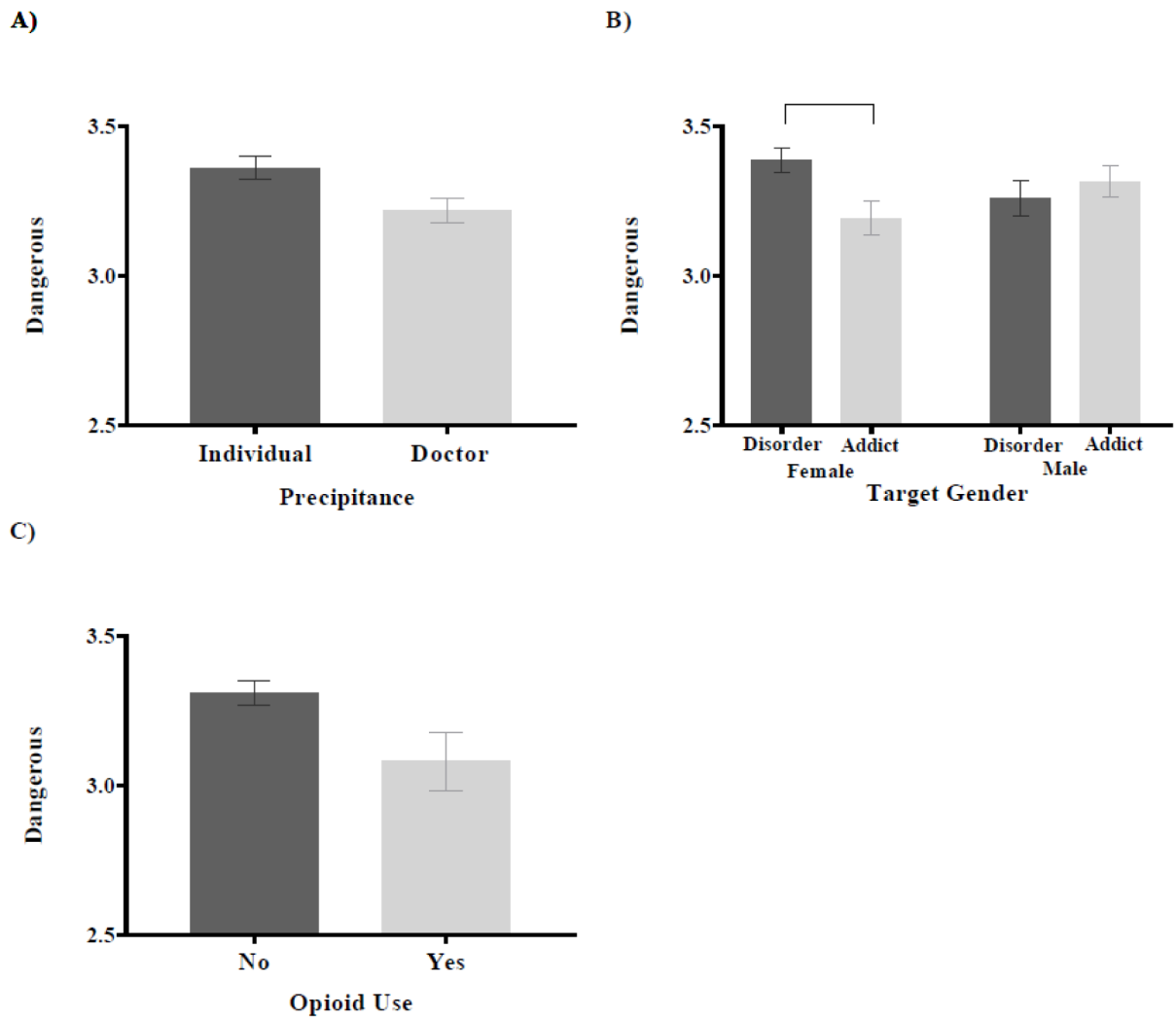


Figure 2. Dangerousness.

A) For the main effect of Precipitance, individual was rated with higher dangerousness than doctor ($p = .011$). **B)** The Target Gender x Language interaction effect showed that within the female condition, disorder was rated with higher dangerousness than addict ($p = .015$). **C)** Participants who had used nonmedical prescription opioids had overall lower dangerous ratings compared to participants who had not used nonmedical prescription opioids ($p = .026$).

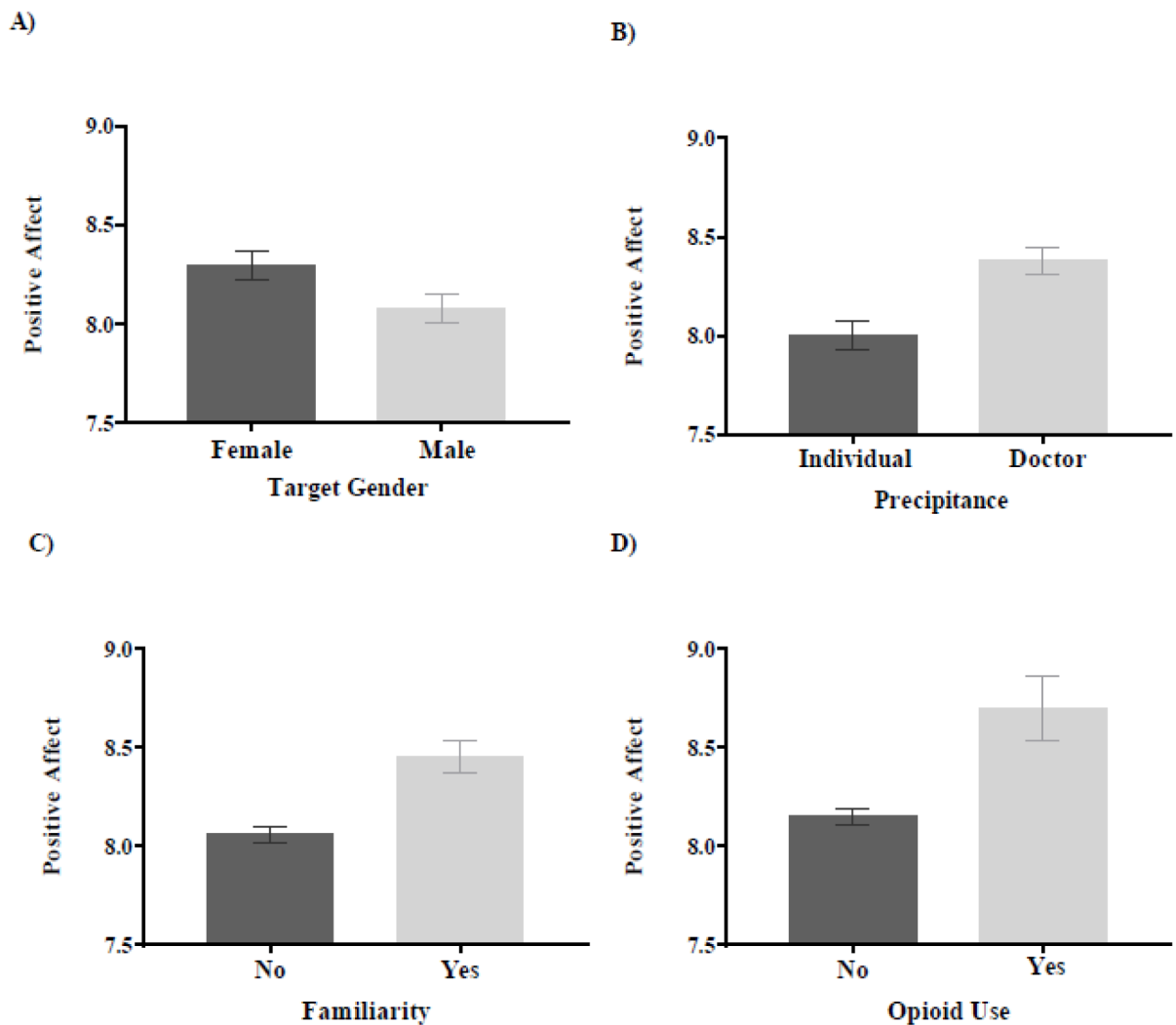


Figure 3. Positive Affect.

A) For the main effect of Target Gender, female was rated with higher positive affect than male ($p = .028$). **B)** For the main effect of Precipitance, doctor was rated with higher positive affect compared to individual ($p < .0001$). **C)** Participants who knew someone with an opioid addiction had higher overall positive affect ratings compared to participants who did not know someone with an opioid addiction ($p < .0001$). **D)** Participants who had used nonmedical prescription opioids had higher overall positive affect ratings compared to participants who had not used nonmedical prescription opioids ($p = .007$).

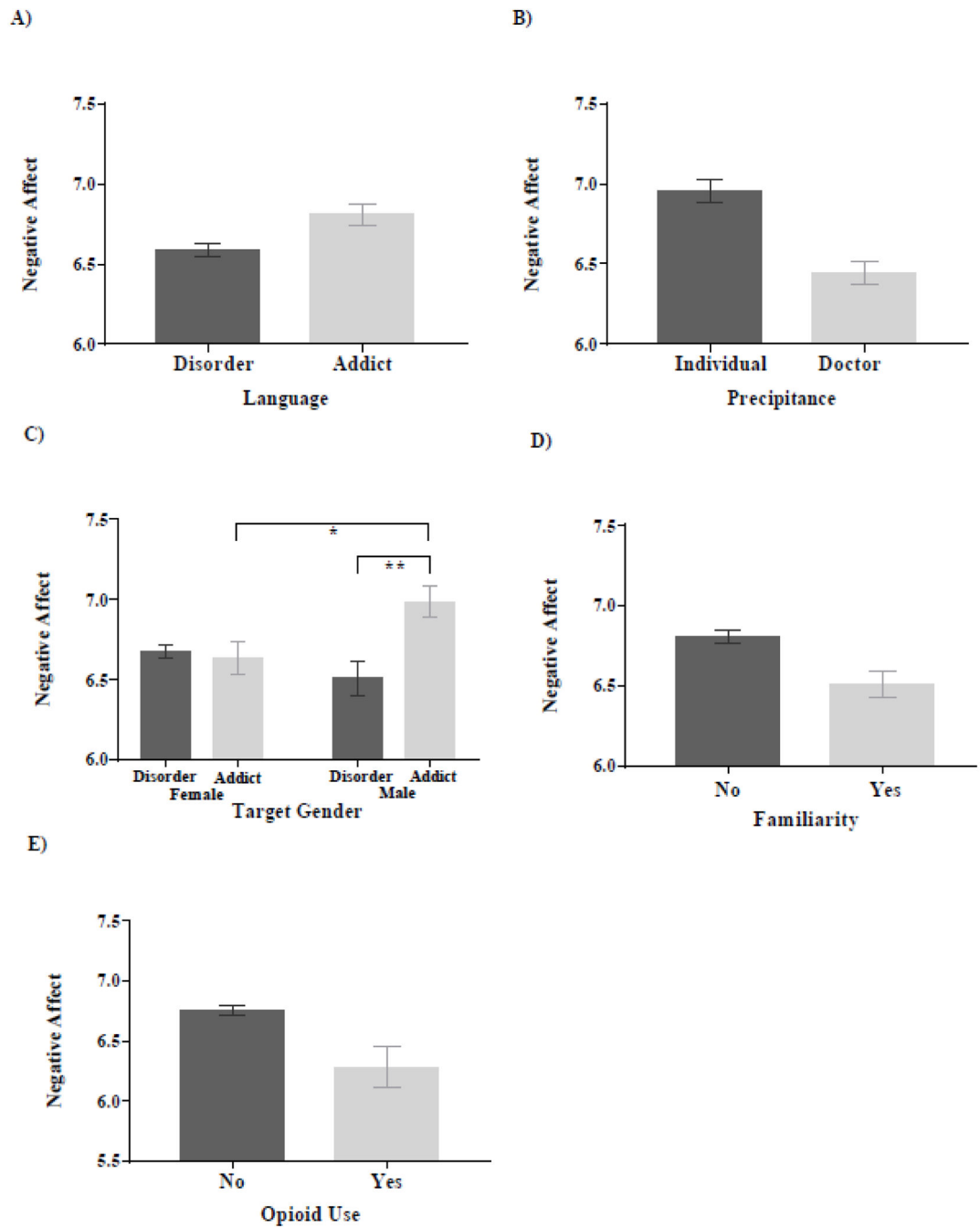


Figure 4. Negative Affect.

A) For the main effect of Language, addict was rated with higher negative affect compared to disorder ($p = .031$). **B)** For the main effect of Precipitance, individual was rated with higher negative affect compared to doctor ($p < .0001$). **C)** For the interaction effect of Target Gender by Language, male was rated with higher negative affect compared to female in the addict condition ($*p = .031$) and in the male condition, addict was rated with higher negative affect compared to disorder ($**p = .001$). **D)** Participants who knew someone with an opioid addiction had lower overall negative affect ratings compared to participants who did not

know someone with an opioid addiction ($p = .009$). **E**) Participants who had used nonmedical prescription opioids had lower negative affect compared to participants who had not used nonmedical prescription opioids ($p = .016$).

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Table 1.

Example case vignette scenario with female, opioid use disorder and doctor

Jane currently has an opioid use disorder.

Her situation started one year ago, when she twisted her ankle while jogging. To make her mild pain go away, she was given a prescription for a bottle of painkillers from a medical doctor. The bottle included a one-month supply of pills even though injuries like this typically take a couple of days to heal.

Although Jane's pain went away in two days, she finished the entire bottle over the next month. After that, she was unable to resist her cravings for more painkillers. Excessive drug use caused her to lose her job and she now spends much of her time obtaining and using more painkillers.

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Table 2.

Descriptive Statistics on Demographic Measures.

Measure	$aM \pm bSD$ & Frequencies
Age	36.9 \pm 12.32
Gender	
Male	1395
Female	1197
Other	13
Race	
American Indian/Native American	11
Asian	203
Black/African American	181
Hispanic/Latino	120
White/Caucasian	1948
Pacific Islander	5
Other	18
Mixed race	119
Income (\$)	
Less than 12,000	386
12,000–29,000	586
30,000–47,999	601
48,000–66,000	473
More than 66,000	559
Education	
Eighth grade or lower	2
Some high school	12
High school graduate	223
Some college	725
Professional training/license	92
College graduate	1130
Graduate degree	421
Familiarity	
Yes	935
No	1670
Current/past opioid use	
Yes	235
No	2370
Total ^c PSAS Score	28.4 \pm 5.243

^aM = mean^bSD = standard deviation^cPSAS = Perceived Stigma of Addiction Scale

Table 3.

Inferential statistics for measures based on scenario.

Measure	Statistic	<i>p</i> -value
Age	F(7, 2597) = 0.632	0.730
Gender	χ^2 (14) = 12.73	0.548
Race	χ^2 (49) = 58.33	0.170
Income	χ^2 (28) = 23.92	0.686
Education	χ^2 (42) = 41.46	0.494
Familiarity	χ^2 (7) = 15.06	0.035
Current/past opioid use	χ^2 (7) = 2.35	0.938
Total ^a PSAS score	F(7, 2597) = 2.312	0.024

^aPSAS = Perceived Stigma of Addiction Scale

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