Comparing Effects of Different Models of Addiction on Attitudes Toward Opioid Use Disorder (OUD)
Honors in Psychology Project
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Abstract
In response to the pressing public health issue of the opioid use disorder (OUD) epidemic and the barriers that stigmatization poses in addressing it, this study explored the impact of the biological and environmental explanations for OUD on attitudes toward stigmatizing factors and responses to the crisis. Amazon Mturk workers \((N = 309)\) completed an online survey. As predicted, perceived control over OUD was a significant predictor of attitudes toward evidence-based harm reduction responses (overdose prevention, syringe services programs, and medication-assisted treatment). Stronger beliefs in environmental influences and in OUD as a biological disease were both significant predictors of lower perceived control over OUD. In addition, both brain disease and developmental learning model beliefs were significant predictors of support for progressive societal responses to the epidemic. Implications for educating the public about both biological and environmental explanations for OUD are discussed.
Comparing Effects of Different Models of Addiction on Attitudes

Toward Opioid Use Disorder (OUD)

Opioids pose a significant threat to public health; an estimated 26.4 to 36 million people worldwide suffer from opioid use disorder (OUD), currently considered an epidemic (Woo et al., 2017). According to the National Survey of Drug Use and Health, an estimated 2.1 million people in the United States exhibited symptoms of an opioid use disorder at some point in 2016 (Ahrnsbrak, Bose, Hedden, Lipari, & Park-Lee, 2017). One significant concern regarding opioids is death from drug overdose. In the United States in 2016, approximately 42,000 overdose deaths were attributed to opioids (Saloner et al., 2018). In addition to fatal and nonfatal overdose risks, OUD results in approximately $55.7 billion in workplace, health, and criminal justice systems costs every year in the United States (Woo et al., 2017). Overall, opioid misuse and OUD pose a significant threat to public health, necessitating appropriate responses to the opioid epidemic. One such approach involves reducing stigmatization surrounding people with addiction and evidence-based treatment and prevention strategies.

Stigmatization’s Contribution to the Opioid Epidemic

Stigmatization contributes to the opioid epidemic in a variety of ways. A longitudinal study by Fleury, Greiner, Bamvita, Perreault, and Caron (2014) sought to identify factors that predicted new cases of substance use disorders (SUDs) across a two-year period. Specifically, the study looked at differences in sociodemographic, clinical, life perception, and service use factors. The researchers found stigmatization to be the strongest predictor of substance use disorder. In other words, experiences of stigmatization in people who use drugs was strongly associated with a shift from substance use to substance use disorder.
In addition to contributing to the overall harm of addiction, stigmatization of people with OUD directly impacts the availability and effectiveness of treatment and prevention strategies. For example, Woo et al. (2017) found that social stigma about methadone maintenance (an evidence-based treatment for OUD with successful treatment outcomes) had negative consequences, such as making people who need it reluctant to seek out treatment and less likely to remain in treatment once they start. Many participants (28% to 56%) reported aversive effects on both their lives and treatment from stigmatization, leading to “lower self-esteem; conflicts with friends/family; reluctance to initiate, access, or continue methadone maintenance treatment (MMT); and distrust toward the health care system” (Woo et al., 2017, p. 9). Therefore, an important step in understanding and addressing the opioid epidemic involves reducing stigmatization surrounding drug dependence and treatment strategies for it.

A study by Earnshaw, Smith, and Copenhaver (2013) further confirmed the negative impacts of stigmatization on treatment outcomes, finding experiences of stigma among methadone maintenance patients to be a strong barrier to success in treatment. As a result of experiencing this stigma, participants reported feelings of anger, frustration, and anxiety, which had direct impacts on their mental well-being. Earnshaw et al. (2013) also sought to identify the different sources of stigmatization for people in MMT programs, finding that stigma was strongest in friends and family, then health care workers, and weakest but still present in coworkers and employers. This stigma characterization involved being viewed by these groups as lower than them and untrustworthy. Overall, this study showed that even for people in treatment for drug addiction, stigma continues to impact their lives and impede their recovery. This study also established the existence of stigma beyond health care workers to participants’
family, friends, coworkers, and employers as well. Thus, effective strategies for reducing this stigma are needed.

Not only does stigmatization affect treatment seeking and effectiveness for individuals with OUD, it also negatively impacts the general public’s support for evidence-based treatment options. In a survey of public opinions toward MMT, Matheson et al. (2014) found strong negative attitudes and doubts about the treatment from the public. Over half of respondents indicated no willingness to pay for these treatments. These findings show that despite research consistently demonstrating the effectiveness of opioid replacement therapy, public support continues to be low and the treatment remains controversial. While the sample for this survey was from Scotland, it still has important implications for American attitudes because it establishes the link between negative attitudes (stigmatization) and reduced support for treatment. This lack of support translates into making evidence-based treatment for OUD unavailable to many of the people who need it (Vestal, 2016). Therefore, stigmatization of substance dependence perpetuates the cycle of people developing SUDs, relapsing, and dying rather than receiving treatment and recovering.

Perceived Control and Stigma

It is not enough simply to know the impacts of stigmatization; there also needs to be an understanding of what drives the stigmatization surrounding addiction and OUD. Weiner, Perry, and Magnusson (1988) explored the relationship between causal attributions and stigma across two experiments to discover whether the perceived degree of control individuals have over the cause of a stigmatized condition or characteristic produced different reactions. The researchers found that higher perceptions of control produced more negative affective reactions (e.g., anger or dislike) and judgments to not help. Additionally, the investigators found that physically based
stigmas (e.g., paraplegia) differed from those considered mentally based, with mental-behavioral stigmas (e.g., drug addiction) found to be perceived as more controllable. Overall, this study established that higher perceived controllability is strongly associated with greater stigmatization.

A public opinion survey by Barry et al. (2015) explored the U.S. general population’s experience with and attitudes toward opioid use and OUD. The researchers found that most respondents viewed individuals with addiction as major contributors to the problem as well as being the most responsible for solving the problem. This relationship was further demonstrated by Kennedy-Hendricks et al. (2017), who explored stigma and blame attributions in the general public through a nationally representative online survey. Of the 1,071 respondents who reported their attitudes and beliefs toward persons with prescription OUD, 78% had the belief that individuals were to blame for their disorder. Overall, this shows that the American public blames individuals for having OUDs.

Not only is a relationship between stigma toward people with OUDs and perceptions of individuals’ control found in the general public, but it is found among health care workers, too. In a study measuring attitudes and beliefs of health care workers who treat injecting drug users, Brener, Hippel, Kippax, and Preacher (2010) found that the higher the perceptions of controllability held by the health care workers, the greater their negative attitudes were toward injecting drug users.

This relationship was also explored by Kennedy-Hendricks et al. (2016), who examined primary care physicians’ (PCPs) causal attributions for prescription OUD and beliefs about who PCPs think is responsible for addressing the problem. The study found overall negative attitudes toward people with prescription OUD, and individually oriented causes were the most frequently
endorsed. Additionally, while clinical effectiveness of several treatments for OUD have been shown, PCPs’ perceptions did not reflect this reality, with only 58% of respondents reporting that they believed there were any effective treatment options available for people with OUD.

In two related studies, Goddard, Sharpe, and Kozlowski (2016) assessed college students’ attitudes toward three harm reduction strategies (overdose prevention, syringe services, and medication-assisted treatment), beliefs about individuals’ control over heroin addiction, and the extent to which participants viewed heroin addiction as a biological disease. Results from the two studies showed that perceived controllability was the strongest predictor of opposition to heroin-related harm reduction strategies. Overall, this shows that across populations (i.e., college students, the general public, primary care physicians, and health care workers specializing in addiction treatment), stigmatization of OUD is high and is often fueled by perceptions of individual control over the disorder, effectively downplaying the various biological, psychological, social, and environmental factors relating to OUD.

**Brain Disease Model**

The brain disease model rose to prominence when it was endorsed by then-director of the National Institute on Drug Abuse Alan Leshner (1997), who asserted that “addiction is a brain disease, and it matters” (p. 45). Leshner (1997) argued that addiction is a chronic, relapsing brain disease, citing advances in neuroscientific knowledge and behavioral science that had identified key biological mechanisms in the development of addiction. Leshner (1997) contended that scientific knowledge about addiction was not reflected in the public’s attitudes. The defining aspect of the brain disease model is that drug use modifies brain structure and function, evident in research showing that the brains of individuals with addiction have distinct differences from nonaddicted brains. However, the public’s primary understanding of addiction is that it is a moral
problem to be fixed through punishment and the criminal justice system. Leshner asserted that this moralistic ideology contributes to addiction-related stigma in that the public views those with SUDs as weak, without morals, and unable to control their desires. This stigma served as a barrier to addiction being treated as a disease deserving of medical attention. He countered the moral view with the argument that addiction is a health issue that needs to be addressed through treatment provided within the health care system. The goal was to use the brain disease model as a replacement to the popular moralistic characterization of addiction. According to Leshner, the brain is at the core of the problem, and any treatments must therefore center around the brain and biological interventions.

Since the publication of Leshner’s treatise in 1997, the brain disease model has been adopted by many in the field of addiction research and is often credited with decreasing stigma and increasing public support for treatment (e.g., Volkow, Koob, & McLellan, 2016). However, others have found that this model falls short in reducing stigmatization, even when it increases support for treatments. In a survey measuring the impact of efforts to change public opinion about mental illness, Pescosolido et al. (2010) found a positive relationship between holding a neurobiological conception of mental illness (i.e., schizophrenia, depression, and alcohol dependence) and endorsing treatment, but the neurobiological conception was either unrelated to or increased the odds of stigmatization.

In other criticism of the disease model, Hall, Carter, and Forlini (2015) argued that the model had not delivered on its promises of creating more effective treatments and improving public health policies related to addiction. Instead, these researchers argued that a more productive approach is to treat addiction as a complex biological, psychological, and social issue. To decrease the harms of drug misuse, they asserted that interdisciplinary work integrating
findings from neuroscience, epidemiology, sociology, psychology, and related fields is necessary.

Additional critics of the brain disease model include Satel and Lilienfeld (2014), who contended that the brain disease view of addiction fails to capture the full context in which addiction occurs by placing too much emphasis on the biological while undervaluing environmental, psychological, and social factors. The authors encouraged a more complex understanding of addiction that incorporates these other factors while retaining biological influences.

Satel and Lilienfeld maintained that while the disease model attempts to correct the misconceptions that addiction is a weakness of character or moral failing (the moral model) by taking control and blame away from the individual, research has shown that this has not always decreased stigmatizing attitudes. Instead, the view that people with SUDs are powerless in their situation can make them feel less optimistic about their ability to recover (Satel & Lilienfeld 2014).

In general, critics of the disease model are trying to achieve the same goal as those who endorse the model: reducing stigmatization surrounding addiction and creating more effective strategies for treating and preventing it. What is under debate is the most effective model of addiction for reducing stigmatization and the harms it produces. Because an important driver of stigmatization is perceptions of control, decreasing the perceived controllability of addiction is one possible route to achieve reductions in stigmatization. While higher perceived controllability led to more stigmatization, greater negative emotional responses, and decreased judgments to help, Weiner et al. (1988) found that when the reason for the stigmatizing condition (e.g., drug addiction) was judged to be less controllable by the individual (e.g., becoming addicted as a
result of being prescribed medications to treat an injury), that individual was stigmatized less than if the reason was judged to be more controllable (e.g., becoming addicted from experimenting with recreational drugs). Thus, it may be possible to produce more positive reactions by discussing the uncontrollability of stigmatized outcomes, and what is needed is a deeper understanding of ways to reduce perceived responsibility of stigmatized individuals.

One effective way to change perceptions of control is through the promotion of disease model beliefs. Individuals with greater belief in the disease model of addiction were more likely to perceive opioid use disorder as being outside of the individual’s control (Goddard et al., 2016). In other words, greater belief in the disease model led to less stigmatizing attitudes and more support for harm-related treatment strategies by reducing perceived controllability. However, these studies did not assess beliefs about any other addiction models. Thus, the question remains whether an alternative to the disease model can produce similar or greater reductions in perceived control, and consequently greater support for evidence-based treatment strategies.

**Developmental Learning Model**

The developmental learning model of addiction has been suggested as a solution to the brain disease model’s shortcomings (Lewis, 2018). This model incorporates the biological explanations from the disease model while also emphasizing the social, environmental, and psychological context of addiction. Lewis (2018) asserts that biological factors are the core of the brain disease model, with other factors (i.e., social, environmental, psychological) streaming from this core; in contrast, biological factors are equally emphasized among other contributing factors in the developmental learning model.
In a review examining addiction within the developmental learning model framework, Lewis (2018) disputed the well-accepted idea that addiction is pathological by arguing that the neurobiological changes that accompany addiction (specifically, automatization, reduced neural flexibility, enduring cue sensitization, and reward desensitization) are simply normal features of learning in response to a variety of complex, interacting biological, psychological, and social factors. This contrasts with the brain disease model, which frames addiction as pathological and chronic and emphasizes biological factors as the cause of the pathology. Lewis (2018) advocates for a “comprehensive, balanced model of addiction” (p. 7) that recognizes the connections between the organism and environment, which occur “at every level, from perception to cognition to behavior, and interact continuously as an open system” (p. 7). Therefore, Lewis (2018) argues that the learning model of addiction is a suitable alternative to the brain disease model because it reinterprets existing neurological findings while successfully incorporating psychological, developmental, and environmental factors. The learning model frames addiction not as a pathological and chronic disease, but as an understandable reaction to a complex interaction of circumstances that becomes a maladaptive coping mechanism. The value of the learning model is that it has the potential to eliminate the negative effects seen from the disease conception while still replacing the moral model that blames people for their addiction.

Further support for the developmental learning model lies in research finding strong associations between childhood adversity and trauma on lifetime prevalence of addiction. For example, Dube et al. (2003) investigated the influence of stressful and traumatic childhood experiences on drug abuse by exploring the relationship between 10 categories of adverse childhood experiences (ACEs) and illicit drug use. Adverse childhood experiences prior to age 18 included abuse and neglect as well as criminality, substance abuse, and mental illness among
household members. The study found a 2- to 4-fold increase in the likelihood of illicit drug use for each of the 10 categories. In addition, there was a strong dose-response relationship between the number of ACEs experienced and the likelihood of substance use disorder in adulthood. The study also examined different ages of substance use initiation (by 14 years old, 15-18 years old, or as an adult) and found the strongest graded relationship for initiation by age 14. Stressful and disturbing childhood experiences may explain illicit drug use as an attempt to self-regulate emotions and cope with emotional pain during a time when the body is undergoing natural developmental changes and lifetime coping strategies are being developed.

Choi, DiNitto, Marti, and Choi (2017) examined the relationship between ACEs and lifetime mental and substance use disorders (MSUDs) in the population of adults aged 50 and over. These researchers’ goal was to explore childhood development and environmental risk factors that could play a role in the growing older-adult population with MSUDs. They found a dose-response relationship between ACEs and MSUDs, with higher number of ACEs associated with greater odds of have any MSUD in their lifetime.

While drug-related deaths have increased in the U.S. to the point of being recognized as an epidemic, these deaths are not evenly distributed across the population. This is evident in large county-level difference in these death rates, yet the role of social determinants of health in drug-related mortality has been underexplored. Monnat (2018) attempted to fill this gap in knowledge by exploring associations between economic, social, and health care environments and county-level reports of drug-related deaths. Results confirmed past findings, in that drug overdose patterns had an uneven geographic distribution. Further, the study showed that areas with greater economic and family distress, indicated through measures such as poverty and unemployment rates, had higher rates of drug mortality. These findings add to research
consistently showing socioeconomic status as a significant social determinant of health. Monnat (2018) also argued that protective factors against substance misuse are undermined by the stress placed on families and communities from economic insecurity.

Zoorob and Salemi (2017) explored the role of social determinants of health in addiction by looking at the relationship between social capital and drug-related mortality rates. Social capital is the degree and depth of social trust, norms, and networks, which can be measured through feelings of belonging to the community, trust in the community, participation in community and civic engagement, density of social networks, and positive interactions with community members. Communities with higher social capital have been found to have lower mortality rates and better self-reported health. Therefore, Zoorob and Salemi sought to explore social capital as a protective factor against overdose rates. They found that county-level social capital strongly correlated with lower drug overdose mortality rates. This study adds to the literature suggesting that addiction has environmental and social roots that help to determine health outcomes.

Dasgupta, Beletsky, and Ciccarone (2018) proposed that the opioid crisis is a public health emergency that needs to be addressed through a framework focused on structural and social determinants of health, as opposed to disease. They asserted that on overemphasis has been placed on the drugs themselves and their availability, while this is only one part of the problem. Rather, Dasgupta et al. (2018) contended that the opioid crisis is “fundamentally fueled by economic and social upheaval, its etiology closely linked to the role of opioids as a refuge from physical and psychological trauma, concentrated disadvantage, isolation, and hopelessness.” (p. 1). They argued for an alternative explanation for the high demand for opioids, where “intensifying substance use may be a normal societal response to mass traumatic events,
especially when experienced by people in lower socioeconomic strata” (p. 3). Therefore, in addition to increased access to evidence-based treatments for OUD, the authors stated that structural and social changes are needed, such as including economic development strategies in solutions to the opioid crisis.

Overall, there is a wide range of research showing the many factors associated with OUD and drug-related deaths, such as economic, social, psychological, and biological elements. Therefore, there is a need for a model of addiction than can most accurately account for and explain the role of each factor individually as well as interactions between factors. The developmental learning model may be more effective at integrating the variety of influences on addiction (Lewis, 2018). Moreover, the developmental learning model framing may reduce stigmatization of addiction because it goes beyond the individual to encompass social and environmental causes that may not be perceived as the addicted individual’s fault.

**Comparing the Impact of the Brain Disease Model and Developmental Learning Model**

In this study, we compared the relative predictive value of the brain disease and developmental learning models of addiction. Consistent with previous studies (e.g., Goddard et al., 2016), we presented participants with information about the opioid epidemic, its possible causes (brain disease and developmental learning model concepts), and evidence-based responses (overdose prevention efforts, syringe services programs, and medication-assisted treatment). We then assessed participants’ attitudes toward each of the responses, as well as their perceptions of how controllable OUD is and their beliefs about the brain disease and developmental learning models. We then used multiple regression analyses to examine the relative strength of different variables in predicting attitudes toward the evidence-based responses.
We hypothesized that perceived controllability of OUD would be the strongest predictor of attitudes toward each of the evidence-based responses, as it has been in several previous studies. Further, we predicted that neither disease model nor developmental learning model beliefs would be significant predictors of evidence-based responses.

With the first hypothesis supported, we conducted exploratory analyses to determine whether beliefs in the disease model, the developmental learning model, or both significantly predict perceived controllability of OUD. Past studies (e.g., Goddard et al., 2016) have shown that disease model beliefs are strong and consistent predictors of this criterion, but because no alternative models have been examined, specific predictions about the significance of the developmental learning model as a predictor of perceived control were not made.

Finally, we developed seven items to assess participants’ attitudes toward progressive societal approaches to OUD, such as treating the disorder as a public health problem and improving educational and economic opportunities to combat it. These items were designed to detect the putative influence of both the brain disease and developmental learning models on how society as a whole should address OUD, beyond specific responses such as overdose prevention, syringe services programs, and medication-assisted treatment.

Method

Participants

Participants were recruited through Amazon’s Mechanical Turk (MTurk) database; only workers residing in the U.S. were eligible to participate. A total of 357 participants completed the online survey and were paid $1 each. The final sample used for analysis was 309 participants; 48 were excluded for failing to respond affirmatively to Item 19 (the statement “I am reading and thinking carefully about each of the statements in this survey”). The 309 retained
participants came from 50 states and had a mean age of 35.32 ($SD = 10.25$), with ages ranging from 19 to 70 years old. A slight majority (58%) was male, and the most represented racial group was White/Non-Hispanic (81%), while 8% identified themselves as African-American/Non-Hispanic, 4% as Hispanic/Latina, and approximately 4% as Asian/Pacific Islander. The modal level of educational attainment was an undergraduate degree (38%), followed by some college or technical/professional training (26%) and a graduate or professional degree (21%). Political identity was also reported on a 7-point Likert scale ($1 = strongly liberal, 7 = strongly conservative$); the mean was 3.48 ($SD = 1.94$) and the median was 3.

**Measures and Procedure**

All measures (see Appendix A) and procedures were approved by the NKU Institutional Review Board before any data were collected. From the MTurk list of available tasks, participants read a brief description of our study entitled “Opinions about Opioid Use Disorder.” Those who chose to participate were linked to Qualtrics, where they first had to read a consent form to continue. Participants then read a brief description of the opioid epidemic, the brain disease and developmental learning models, and evidence-based responses. The text was divided into sections, with 1-2 manipulation check items between each section designed to verify that participants had comprehended each section. However, concerns about the clarity of the manipulation check instructions were brought to the researchers’ attention by a participant after the study was conducted. We realized belatedly that some participants may have interpreted the manipulation check questions as measures of their attitudes rather than their reading comprehension. Therefore, only Item 19 was used to eliminate participants from analyses.

Next, participants responded to a set of 16 Likert-scale items to measure their attitudes toward (a) overdose prevention with naloxone (5 items), (b) syringe services programs (5 items),
and (c) medication-assisted treatment (6 items). Variations of these items have been used in several previous studies (e.g., Goddard et al., 2016). Next, participants responded to a set of items designed to assess (a) their perceptions of the controllability of opioid use disorder (8 items), (b) the extent to which they believe the brain disease model (5 items), (c) the extent to which they believe the developmental learning model (5 items), and (d) their belief in progressive societal responses to OUD (7 items). Participants also responded to a validity item (#19) designed to detect random responding. Finally, participants responded to demographic questions and read a debriefing describing the purpose of the study. They were paid $1 through Amazon Mturk for completing the survey.

**Internal consistency analyses and construction of indices.** Items were combined into indices to reduce the number of variables included in subsequent analyses. Versions of items about attitudes toward overdose prevention, mediation-assisted treatment, and syringe services programs, as well as the perceived control and disease model beliefs items, have been used in previous studies and were found to have Cronbach’s α’s exceeding .70, permitting the calculation of mean ratings across items. The internal consistency analyses conducted for this study permitted the creation of single scores representing participants’ responses regarding (a) overdose prevention (Cronbach’s α = .74), (b) syringe services programs (Cronbach’s α = .77), (c) medication-assisted treatment (Cronbach’s α = .73), (d) perceived controllability of opioid use disorder (Cronbach’s α = .87), (e) brain disease model beliefs (Cronbach’s α = .74), and (g) progressive societal responses to OUD (Cronbach’s α = .75). The only items that were not able to be combined into a single scale were the developmental learning model questions (Cronbach’s α = .62).

**Results**
The simultaneous combination of perceived control, disease model beliefs, beliefs about developmental learning (i.e., environmental) influences, and political identity (found in Goddard et al. [2016] to be a significant predictor) variables were used to predict, in separate multiple regression equations, the criteria of attitudes toward overdose prevention, syringe services programs, and medication-assisted treatment. Another multiple regression analysis was then conducted using perceived controllability as the criterion and the contrasting model beliefs and political identity as predictors. Finally, an exploratory multiple regression analysis was conducted to predict the progressive societal responses to OUD from perceived controllability, political identity, disease model beliefs, and separate beliefs about the developmental learning model.

Of the three harm reduction practices, overdose prevention had the highest overall approval ($M = 3.81, SD = .76$); followed by MAT ($M = 3.64, SD = .72$), and SSPs received the lowest overall approval ($M = 3.50, SD = .88$). These findings are consistent with previous studies by Goddard et al. (2016).

The first multiple regression analysis conducted used the three harm reduction practices as separate criteria and simultaneously entered perceived uncontrollability of OUD, disease model beliefs, political identity, and separate items related to developmental learning model influences (escape from trauma, sources of happiness in life, childhood abuse or neglect, coping mechanisms of young people, and job prospects) as predictors (see Table 1). For all three practices, the overall regression was significant ($R^2$s ranged from .50 to .54, all $ps < .001$). Greater perceived uncontrollability and greater disease model beliefs significantly predicted more positive attitudes toward all three harm reduction strategies. A more liberal-leaning
political identity significantly predicted more positive attitudes toward overdose prevention, syringe services programs, and medication-assisted treatment.

For the individual items measuring belief in environmental influences on addiction, significant prediction of positive attitudes toward all three harm reduction strategies only occurred for the item measuring agreement that having good job prospects decreases the risk of opioid use disorder. Greater agreement that opioids as an escape from trauma can lead to OUD significantly predicted more positive attitudes toward OD prevention and MAT, but not syringe services programs. More positive attitudes for OD prevention alone was found for greater belief that young people may develop opioid use disorder because they have not learned other ways to cope with stress, while greater agreement that opioid use disorder is more likely to develop when people have few sources of happiness in their lives was a significant predictor of positive support for MAT.

Another multiple regression analysis was conducted using perceived uncontrollability as the criterion and disease model beliefs, political identity, and single items measuring developmental learning model influences as simultaneous predictors (see Table 2). The overall regression was significant ($R^2 = .37, p < .001$). Greater belief in the disease model, liberal political identity, opioids as an escape from trauma, and good job prospects decreasing risk significantly predicted stronger beliefs that OUD is out of individuals’ control. No other predictors were significant.

The last multiple regression analysis conducted used attitudes toward progressive societal responses to opioid use disorder as the criterion, while perceived uncontrollability, disease model beliefs, political identity, and the five individual developmental learning model items were entered simultaneously as predictors (see Table 3). Again, the overall regression was significant
(R^2 = .56, p < .001). All variables except for the single item about opioids as an escape from trauma were significant predictors of more favorable attitudes toward progressive responses to OUD.

**Discussion**

This study looked at the impact of information about biological and environmental explanations for OUD on attitudes, results suggesting that greater belief in these explanations increases support for harm reduction strategies and progressive societal responses to OUD. The hypothesis that perceived controllability of OUD would be the strongest predictor of attitudes toward each of the evidence-based responses was supported. Additionally, a more liberal political identity was found to be a predictor of greater support for evidence-based practices.

Exploratory analyses were conducted to determine the extent to which each model predicted perceived controllability of OUD. The hypothesis that disease model beliefs would be a significant predictor was supported. Because the impact of attitudes toward the developmental learning model on perceived controllability had not been measured before, we made no specific predictions; nevertheless, results were significant and paralleled those found for the disease model.

An additional exploratory analysis revealed that both the disease model and developmental learning model beliefs were significantly associated with perceived control and with progressive society-level responses to the opioid epidemic.

The first hypothesis was derived from past research by Goddard et al. (2016), which found that beliefs about individuals’ control over OUD was the strongest and most consistent predictor of attitudes toward harm reduction strategies. Furthermore, these studies established the predictive power of brain disease model beliefs, where stronger beliefs were found to be
associated with lower perceptions of individual control over the disorder. Therefore, Goddard et al. (2016) also influenced the exploratory analysis looking to determine the extent to which both brain disease model and developmental learning model beliefs predicted perceived control.

The current study extended past research by measuring the impact of the developmental learning model, which primarily represents environmental influences on addiction, on attitudes toward OUD. This research was exploratory in its analysis of the impact of alternative models of addiction on attitudes toward OUD and future research is necessary to determine the specific impacts of the developmental learning model.

New to this study was the inclusion of questions regarding progressive societal responses to OUD, which go beyond the focus on attitudes toward treatment of individuals. This expanded focus is useful because it has implications for the policy choices surrounding responses to the opioid epidemic. Our results are consistent with the possibility that educating the general public has the potential to reduce stigmatization of OUD and increase support for evidence-based treatment and prevention strategies, including structural societal changes. For example, these findings show support for both preventing drug overdose through healthier economic environments and increasing interventions in areas with significant economic distress (Monnat, 2018). The results may also suggest support for efforts to increase community cohesiveness and resilience and to give increased support to communities with low social capital (Zoorob & Salemi, 2017).

The current findings are consistent with implications for healthcare system reform, including the need for more emphasis on educating both primary care practitioners and those who work directly with people with addiction (Brener et al., 2010; Kennedy-Hendricks et al., 2016). Related, this education could stress the lack of individual control over the factors
contributing to addiction and emphasize the need to turn away from a punishment mentality toward one that involves meeting people where they are and treating them with respect and empathy.

This more humane approach to addiction is discussed by Szalavitz (2016), another advocate for the developmental learning model. She argues that punishing people who use drugs through the criminal justice system has not worked to decrease the prevalence of addiction. The emphasis on punishment comes from ideas about the morality of drug addiction and the perceived role of choice on the part of the person with the addiction. Szalavitz (201) contends that part of the response to addiction involves unlearning old habits and relearning healthier ones. The developmental learning model accounts for the role of individuals in their treatment, while remaining situated within a framework that views such learning in the context of lifespan and environmental influences. Thus, this model argues that individuals in recovery from addiction would respond better to positive reinforcement, respect, and empathy. Adopting a focus on respect necessitates a change in the way addiction programs often stress the need for tough love or rock bottom in recovery. In fact, Szalavitz (2016) argues that “compassion is part of the cure; not the disease. Our societal belief that toughness is what works instead is a huge part of why our drug policy is so disastrously inept and harmful” (p. 153). Therefore, the current research is in line with suggestions that increasing knowledge about and belief in factors that are out of the individual’s control is an important step in reframing the way addiction is viewed and subsequently regulated and treated.

This research is limited in that it is unknown how persistent the attitudes toward OUD are over time. Therefore, these results may represent transient attitudes and may not generalize to consistent beliefs. Related, it is possible that demand characteristics impacted results, in that
respondents unconsciously responded in the pattern that they believed the researchers were hoping to find. A limitation specific to this sample is that it is not fully representative of the U.S. population, while still being more representative than if undergraduate students were used. The sample was more highly educated and more liberal than the U.S. population as a whole, as well as having a slight overrepresentation of White males.

This study was unique in looking at the impact of specific environmental explanations on attitudes toward OUD and progressive societal responses. Therefore, future research is needed to determine the extent to which alternative models such as the developmental learning model impact both perceptions of control and attitudes. This would ideally include both replication of this study with larger, more representative samples as well as conducting a true experiment where there is a control group and isolation of the models of addiction to pinpoint specific impacts.

This study found significant predictors of support for evidence-based treatment strategies for OUD (overdose prevention, syringe services programs, and medication-assisted treatment) and progressive societal responses to OUD. Significant predictors included perceived controllability of OUD, political identity, belief in the brain disease model, and belief in separate environmental factors relating to OUD. The predictive power of these items has possible significance for reducing stigmatization of people with OUD because they suggest that information about the biological and environmental explanations for opioid use disorder can increase support for evidence-based practices and progressive societal responses to OUD. Such solutions include educating the public, removing economic and structural barriers, and framing addiction as a medical condition deserving of treatment.
References


Multiple regression analyses (N = 309) conducted to predict attitudes toward overdose prevention, medication-assisted treatment, and syringe services programs.

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
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<th>β</th>
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<td>-2.96</td>
<td>.003</td>
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</tbody>
</table>

**Criterion: Attitudes toward Medication-Assisted Treatment**

| Perceived uncontrollability of opioid use disorder | .29   | .04   | .35   | 7.14  | <.001 |
| Disease model beliefs                              | .19   | .05   | .18   | 3.96  | <.001 |
| Political identity                                 | -.07  | .02   | -.17  | -3.98 | <.001 |
| Escape from trauma                                 | -.11  | .03   | -.17  | -3.54 | <.001 |
| Sources of happiness                               | .12   | .04   | .14   | 3.06  | .002  |
| Childhood abuse or neglect                         | -.03  | .04   | -.04  | -1.80 | .424  |
| Coping mechanisms of young people                  | .04   | .04   | .05   | 1.13  | .261  |
| Good job prospects                                 | -.09  | .03   | -.15  | -3.24 | <.001 |

**Criterion: Attitudes toward Syringe Services Programs**

| Perceived uncontrollability of opioid use disorder | .50   | .05   | .50   | 9.64  | <.001 |
| Disease model beliefs                              | .23   | .06   | .18   | 3.86  | <.001 |
| Political identity                                 | -.08  | .02   | -.18  | -3.93 | <.001 |
| Escape from trauma                                 | -.01  | .04   | -.02  | -3.30 | .763  |
| Sources of happiness                               | .00   | .05   | .00   | -0.2  | .988  |
| Childhood abuse or neglect                         | -.03  | .05   | -.03  | -1.56 | .574  |
| Coping mechanisms of young people                  | -.01  | .05   | -.01  | -1.6  | .872  |
| Good job prospects                                 | -.09  | .03   | -.13  | -2.52 | .012  |

**Notes:**

*Higher scores (1 to 5) indicate more favorable attitudes toward overdose prevention.*

*Higher scores (1 to 5) indicate stronger beliefs that opioid use disorder is out of individuals’*
control.

*Higher scores (1 to 5) indicate stronger beliefs that opioid use disorder is a biological disease.

*Political identity (1 = strongly liberal, 7 = strongly conservative).

*Higher scores (1 to 5) indicate greater agreement that opioids as an escape from trauma can lead to opioid use disorder.

*Higher scores (1 to 5) indicate greater agreement that opioid use disorder is more likely to develop when people have few sources of happiness and satisfaction in their lives.

*Higher scores (1 to 5) indicate greater agreement that children who are abused or neglected are more likely to develop opioid use disorder.

*Higher scores (1 to 5) indicate greater agreement that young people may develop opioid use disorder because they have not learned other ways to cope with stress.

*Higher scores (1 to 5) indicate greater agreement that having good job prospects decreases the risk of opioid use disorder.

*Higher scores (1 to 5) indicate more favorable attitudes toward medication-assisted treatment.

*Higher scores (1 to 5) indicate more favorable attitudes toward syringe services programs.

**Criterion: Attitudes toward Overdose Prevention**

\[ R^2 = .52, F(8, 297) = 39.38, p < .001 \]

**Criterion: Attitudes toward Medication-Assisted Treatment**

\[ R^2 = .54, F(8, 297) = 43.69, p < .001 \]

**Criterion: Attitudes toward Syringe Services Programs**

\[ R^2 = .50, F(8, 297) = 37.74, p < .001 \]
Table 2

Multiple regression analysis (N = 309) conducted to predict perceived uncontrollability of opioid use disorder.

<table>
<thead>
<tr>
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</table>

**Notes:**

<sup>a</sup>Higher scores (1 to 5) indicate stronger beliefs that opioid use disorder is out of individuals’ control.
<sup>b</sup>Higher scores (1 to 5) indicate stronger beliefs that opioid use disorder is a biological disease.
<sup>c</sup>Political identity (1 = strongly liberal, 7 = strongly conservative).
<sup>d</sup>Higher scores (1 to 5) indicate greater agreement that opioids as an escape from trauma can lead to opioid use disorder.
<sup>e</sup>Higher scores (1 to 5) indicate greater agreement that opioid use disorder is more likely to develop when people have few sources of happiness and satisfaction in their lives.
<sup>f</sup>Higher scores (1 to 5) indicate greater agreement that children who are abused or neglected are more likely to develop opioid use disorder.
<sup>g</sup>Higher scores (1 to 5) indicate greater agreement that young people may develop opioid use disorder because they have not learned other ways to cope with stress.
<sup>h</sup>Higher scores (1 to 5) indicate greater agreement that having good job prospects decreases the risk of opioid use disorder.

**Criterion: Perceived Uncontrollability**

$R^2 = .37, F (7, 298) = 24.86, p < .001$
Table 3.

*Multiple regression analysis (N = 309) conducted to predict attitudes toward progressive societal responses to opioid use disorder.*

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**Notes:**

<sup>a</sup>Higher scores (1 to 5) indicate more favorable attitudes toward progressive responses to opioid use disorder.

<sup>b</sup>Higher scores (1 to 5) indicate stronger beliefs that opioid use disorder is out of individuals’ control.

<sup>c</sup>Higher scores (1 to 5) indicate stronger beliefs that opioid use disorder is a biological disease.

<sup>d</sup>Political identity (1 = strongly liberal, 7 = strongly conservative).

<sup>e</sup>Higher scores (1 to 5) indicate greater agreement that opioids as an escape from trauma can lead to opioid use disorder.

<sup>f</sup>Higher scores (1 to 5) indicate greater agreement that opioid use disorder is more likely to develop when people have few sources of happiness and satisfaction in their lives.

<sup>g</sup>Higher scores (1 to 5) indicate greater agreement that children who are abused or neglected are more likely to develop opioid use disorder.

<sup>h</sup>Higher scores (1 to 5) indicate greater agreement that young people may develop opioid use disorder because they have not learned other ways to cope with stress.

<sup>i</sup>Higher scores (1 to 5) indicate greater agreement that having good job prospects decreases the risk of opioid use disorder.

**Criterion: Responses to OUD**

\[ R^2 = .56, F (8, 297) = 47.85, p < .001 \]
Appendix A: Study Materials

Research Study Title: Opinions about Opioid Use Disorder

This protocol was a Qualtrics-based anonymous survey that was posted on the MTurk database and collected data from 357 MTurk workers who reside in the U.S. This Qualtrics survey will be fully anonymized (no IP address or location information will be collected). Participants will be paid $1 each through MTurk for their work.

This is what MTurk workers saw when they perused the list of available tasks:

Title: Opinions about Opioid Use Disorder (10-minute survey)
Study description: This confidential survey asks your opinions about opioid use disorder and how to respond to it. You will earn $1 for your participation.
Link to the survey: https://nku.co1.qualtrics.com/jfe/form/SV_clvq3o74x0Kw66p
Consent Form

Research Study Title: Opinions about Opioid Use Disorder

Principal Investigator: Perilou Goddard, Ph.D. (goddard@nku.edu), 859-572-5463

**Introduction** You are invited to take part in a research study conducted by Dr. Perilou Goddard and senior Mallory Eilerman from the department of Psychological Science at Northern Kentucky University. Before you decide whether or not to participate in the study, you should read this form and ask questions if there is anything that you do not understand.

**Why Are We Doing This Research?** In this research study we want to learn more about the factors that influence the responses available for opioid use disorder (also known as addiction to drugs like heroin and fentanyl).

We are asking you and other MTurk workers to be in the research, because we want to know the opinions of people living in different parts of the U.S.

**Who Should Be in This Research?** You should be in the research study if you are an MTurk worker who lives in the United States and who is at least 18 years old.

**Who Should Not Be in This Research?** You should not be in the research study if you are less than 18 years old.

**What Will You Do in This Research?** If you decide to take part in this study, you will click on a link to the survey. You’ll read some information and answer some questions.

**How Long Will You Be in This Research?** Participation will take no more than 10 minutes.

**What Other Choices Are There?** Your participation is completely voluntary; you are free to change your mind at any time and quit the study. You may skip any questions you do not wish to answer. You will still receive full payment for the study.

**What Are the Bad Things That Can Happen from This Research?** You may be asked questions that make you uncomfortable, such as your opinions about people who have opioid use disorder. Your responses are confidential and no one will trace your responses to you. You do not need to answer any questions that you do not wish to answer. At the end of the study, you’ll get information about where to get help if you are worried about opioid use by yourself or others.

**What Are the Good Things That Can Happen from This Research?** You will earn $1 (through MTurk) for participating in the study. Although there will be no direct benefit to you for taking part in this study, the researcher may learn more about the factors that influence responses to opioid use disorder. The results of this study may lead to better ways to respond to it.
HOW WILL INFORMATION ABOUT YOU BE KEPT PRIVATE?
You won’t put your name anywhere on the survey. Your responses are confidential and won’t be traced to you by anyone. Your MTurk worker ID will not be connected with your survey responses and will not be included in any data files associated with this study—it will only be used to pay you for your work. If you feel that the answer to any question may reveal your identity, you are free to skip those questions.

Only group information will be collected in this survey. No individual responses of any kind will ever be used in presentations or publications of this research. The data file that comes from these surveys will only exist in electronic form and will be stored securely on a password-protected server. Data will be kept for 6 years.

You’ll complete the survey on a computer or smart device (e.g., smart phone, tablet) at a time and place that YOU choose. We recommend that you complete the survey in private so that other people won’t see your responses.

Please note that the data you provide may be collected and used by Amazon as per its privacy agreement. Additionally, this research is for residents of the United States over the age of 18; if you are not a resident of the United States and/or under the age of 18, please do not complete this survey.

WILL YOU BE PAID TO BE IN THIS RESEARCH STUDY?
You will receive $1 for participating in this study.

WHO DO YOU CALL IF YOU HAVE QUESTIONS OR PROBLEMS?
For questions, concerns, or complaints about this research study you can contact Dr. Perilou Goddard (MEP 355, 859-572-5463, goddard@nk.edu).

If you have any questions regarding your rights as a research participant, please contact the Chair of NKU’s IRB, Andrea Lambert South, Ph.D., 859-572-6615 or irbchair@nk.edu.

VERIFYING CONSENT

By clicking continue, I am consenting to being a participant in this study.

a. I consent to participate.
b. I do not consent to participate.
Background Information

[Note: This is the text all participants read. Each section was followed by 1-2 manipulation check questions (TBD) to verify that participants comprehended the content.]

Please read the information below. You'll be asked some questions about it and your opinions later:

As you may know, the United States is in the midst of an opioid epidemic of unprecedented severity. Opioids include many prescription painkillers (such as Vicodin, Percocet, and OxyContin), as well as illicit drugs like heroin and fentanyl.

We know that most people who use opioids, whether prescribed by doctors or used illegally, do not develop opioid use disorder. Researchers are working hard to determine what causes some people to develop life-threatening opioid use disorder (commonly called opioid addiction) while others do not.

For each of the following items, choose the number that corresponds to your belief about the statement:

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>5</th>
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<td></td>
<td>Sure this is NOT true</td>
<td>Not sure whether this is true or not</td>
<td></td>
<td>Sure this IS true</td>
<td></td>
</tr>
</tbody>
</table>

1. Most people who use opioids develop opioid use disorder.
2. Opioids include both legal and illegal drugs.

Many researchers view opioid use disorder as a brain disease. They point out that about 50% of the risk for developing opioid use disorder comes from our genes, so some people are simply born more vulnerable to addiction than others. Scientists also point out that our brains are hard-wired to cause us to feel pleasure when we do things that help our survival, such as eating. However, opioids overload the brain’s pleasure centers and ultimately lead to long-lasting changes in the brain. Powerful cravings for opioids and painful withdrawal symptoms when the drugs are not available make it very hard for people with opioid use disorder to focus on anything else. Thus, opioid use disorder can develop as a result of the brain’s response to the drugs.

For each of the following items, choose the number that corresponds to your belief about the statement:

<table>
<thead>
<tr>
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<th>1</th>
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</tr>
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<tbody>
<tr>
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<td>Not sure whether this is true or not</td>
<td></td>
<td>Sure this IS true</td>
<td></td>
</tr>
</tbody>
</table>

3. Withdrawal symptoms and cravings for opioids are due to changes in the brain.
4. Genes are responsible for about half of the risk for developing opioid use disorder.
Other researchers put more emphasis on people’s experiences and environment to explain opioid use disorder. It is more common in regions with high poverty rates, where good jobs, especially ones that don’t require a lot of education, are scarce. When people lack other sources of pleasure and satisfaction, opioids may offer a temporary escape. Opioid use disorder is more common among people who have experienced abuse, neglect, or the loss of a parent before turning 18. Opioid use disorder also usually starts in the teens or early 20s, when people haven’t learned other ways to cope with life’s obstacles yet. Thus, opioid use disorder can develop as a result of factors like being young, experiencing childhood trauma, feeling hopeless about the future, and living in poverty.

For each of the following items, choose the number that corresponds to your belief about the statement:

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sure this is NOT true</td>
<td>Not sure whether this is true or not</td>
<td></td>
<td></td>
<td>Sure this IS true</td>
</tr>
</tbody>
</table>

5. Having a good job and other sources of happiness increases vulnerability to opioid use disorder.
6. Experiencing abuse or neglect in childhood increases the risk of opioid use disorder.

Overdose is a major health risk from opioid use. Opioid overdose can cause people to stop breathing, and about 15% of opioid overdoses are fatal.

Naloxone, a safe and cheap medication, can reverse an opioid overdose long enough to get the person to a hospital. Naloxone can be injected or administered with a nasal spray to overdose victims whose breathing has stopped or slowed to dangerous levels.

For the following item, choose the number that corresponds to your belief about the statement:

<table>
<thead>
<tr>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sure this is NOT true</td>
<td>Not sure whether this is true or not</td>
<td></td>
<td></td>
<td>Sure this IS true</td>
</tr>
</tbody>
</table>

7. If someone overdoses on opioids, naloxone may help them start breathing again.

Another major health risk associated with opioid use disorder is infection related to unsafe injecting. Because people who inject opioids often don’t have access to sterile syringes, they share them with other people who inject. One consequence is a skyrocketing rate of blood-borne infections such as HIV/AIDS and Hepatitis C, both of which are life threatening and very expensive to treat.

Syringe services programs reduce the spread of blood-borne viruses such as HIV/AIDS and Hepatitis C among people who inject opioids. Sterile syringes are very cheap, but treating the diseases that are spread by unsafe injecting is very expensive. Syringe services programs collect used syringes, disposing of them safely and reducing the danger of accidental needle sticks from syringes discarded in parking lots, trashcans, or public parks. These programs also reach out to people with opioid use disorder, helping them get into treatment quickly when they are ready.
For the following item, choose the number that corresponds to your belief about the statement:

1
Sure this is NOT true

2
Not sure whether this is true or not

3

4

5
Sure this IS true

8. Syringe services programs do not reduce the spread of infections like HIV/AIDS and Hepatitis C.

The most effective treatment for opioid use disorder is called medication-assisted treatment (MAT). The purpose of MAT is to help people with opioid use disorder break the cycle of the disorder and regain control of their health and lives. In MAT, medications like Suboxone or methadone are employed to prevent withdrawal symptoms (like pain, nausea, and diarrhea) that occur when people stop using opioids. In many cases, the medication is decreased gradually over a period of weeks or months until it is no longer needed. In some cases, medication-assisted treatment may continue on a long-term basis, as long as the clients are not using other drugs.

For the following item, choose the number that corresponds to your belief about the statement:

1
Sure this is NOT true

2
Not sure whether this is true or not

3

4

5
Sure this IS true

9. Medication-assisted treatment can prevent painful withdrawal symptoms and help people break the cycle of opioid use disorder.
**Attitudes toward Evidence-Based Responses to Opioid Use Disorder**

For each of the following statements, choose the number that corresponds to your personal attitude or opinion:

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<td>Disagree</td>
<td>Neither Agree nor Disagree</td>
<td>Agree</td>
<td>Strongly Agree</td>
</tr>
</tbody>
</table>

1. People seeking help for opioid use disorder should be able to get medication-assisted treatment with drugs like Suboxone or methadone. (MAT)
2. Overdose prevention kits should be available to friends and family members of people who use opioids. (OD Prevention)
3. Syringe services programs send a message that it's acceptable to use opioids. (SSPs)
4. If people with opioid use disorder receive medication-assisted treatment, they will commit fewer crimes. (MAT)
5. Abstinence (being completely drug free) is the only acceptable treatment option for people who have opioid use disorder. (MAT)
6. People who use opioids should suffer the consequences if they overdose. (OD Prevention)
7. Syringe services programs should be available to people who inject opioids. (SSPs)
8. Medication-assisted treatment is just trading one opioid use disorder for another. (MAT)
9. If people with opioid use disorder have access to overdose prevention kits, they won't be motivated to quit using opioids. (OD Prevention)
10. The costs of medication-assisted treatment (MAT) outweigh the benefits. (MAT)
11. I approve of using overdose kits to save the lives of people who use opioids. (OD Prevention)
12. Having a syringe services program in my community would lead to more people who use or sell opioids hanging out in my neighborhood. (SSPs)
13. Medication-assisted treatment (MAT) should be widely available for people with opioid use disorder. (MAT)
14. Having a syringe services program in a community will not harm local businesses. (SSPs)
15. If people who use opioids get HIV/AIDS or Hepatitis C as a result of injecting drugs, that's the price that they have to pay. (SSPs)
16. Using an overdose prevention kit to save the life of someone who uses opioids may ultimately lead that person to stop using opioids. (OD Prevention)
Measures of Perceived Controllability of Opioid Use Disorder, Brain Disease Model Beliefs, Developmental Learning Model Beliefs, and Implications of the Models

For each of the following statements, choose the number that corresponds to your personal attitude or opinion:


1. People with opioid use disorder are responsible for their condition. (PC)
2. Using opioids to escape from trauma rarely leads to opioid use disorder. (DLM)
3. Opioid use disorder is caused by biological changes in the brain. (BDM)
4. Having opioid use disorder is under the individual's control. (PC)
5. Opioid use disorder is a biological disorder. (BDM)
6. Opioid use disorder is more likely to develop when people have few sources of happiness and satisfaction in their lives. (DLM)
7. If people develop opioid use disorder, it's their own fault. (PC)
8. Opioid use disorder is a moral weakness. (PC)
9. People who were abused or neglected as children are more likely to develop opioid use disorder as adults. (DLM)
10. Opioid use disorder is a disease. (BDM)
11. People who have opioid use disorder can just quit using opioids if they really want to. (PC)
12. Young people may develop opioid use disorder because they haven’t learned other ways to cope with stress. (DLM)
13. People who have opioid use disorder are not to blame for their disorder. (PC)
14. Opioid use disorder is a brain disease. (BDM)
15. To recover from opioid use disorder, people just need to pull themselves together. (PC)
16. People with opioid use disorder have only themselves to blame. (PC)
17. Opioid use disorder is caused in part by one’s genes. (BDM)
18. Having good job prospects increases the risk of opioid use disorder. (DLM)
19. *I am reading and thinking carefully about each of the statements in this survey.
20. People with opioid use disorder can play an active role in their recovery.
21. Increasing educational and job opportunities should reduce the impact of the opioid epidemic.
22. Nothing can be done to prevent opioid use disorder.
23. Reducing child abuse and neglect should help prevent opioid use disorder.
24. More resources should be put into treating opioid use disorder as a public health problem.
25. The best way to deal with opioid use disorder is through the criminal justice system.
26. The best way to deal with opioid use disorder is to treat it like any other medical condition.
Demographic Questions

1. Age

2. Gender [ ] Male [ ] Female [ ] Other/Non-binary [ ] I prefer not to answer

3. Highest level of education attained
   [ ] Some high school
   [ ] GED or high school degree
   [ ] Some college or technical/professional training
   [ ] Undergraduate degree
   [ ] Some graduate or professional school
   [ ] Graduate or professional degree
   [ ] Other

4. Race
   [ ] African American, Non-Hispanic
   [ ] Hispanic/Latino
   [ ] White, Non-Hispanic
   [ ] Asian/Pacific Islander
   [ ] American Indian/Native Alaskan
   [ ] Other

5. Which of the following best describes your political identity?
   [ ] Strongly liberal
   [ ] Moderately liberal
   [ ] Slightly liberal
   [ ] Neutral (moderate)
   [ ] Slightly conservative
   [ ] Moderately conservative
   [ ] Strongly conservative

6. In what state do you currently reside? (drop-down menu)
Debriefing for MTurk Participants:
"Opinions about Opioid Use Disorder" Research Study

Thank you for participating in the "Opinions about Opioid Use Disorder" research study, designed by Dr. Perilou Goddard and Mallory Eilerman. Prior research suggests that people who believe opioid use disorder (OUD) is a disease place less blame on those who suffer from OUD and are more likely to support evidence-based responses such as overdose prevention, syringe services programs, and medication-assisted treatment. However, people’s opinions about other contributors to OUD, such as adverse childhood experiences, poverty, and being a teenager when drug use starts, have not been assessed systematically. We are interested in what impact, if any, these environmental factors have on attitudes toward OUD and how we respond to it.

All questionnaire responses are completely confidential. Your responses will never be connected to any information that can reveal your identity. Your MTurk worker ID will only be used to pay you for your work—it will not be included in any data files associated with this study. The data file generated in this study will never contain any individually identifying information.

You will earn $1 for your participation.

If participating in this study raised any concerns for you about drug use or other problems, please consider contacting your primary care physician or local mental health agency. To locate treatment resources near you, contact the Substance Abuse and Mental Health Services Administration (SAMHSA)’s free and confidential National Helpline at 1-800-662-HELP (4357) (TDD: 1-800-487-4889) or use their online treatment locator at https://findtreatment.samhsa.gov/

If you’d like to find out the study’s results when they become available, or if you have any questions or concerns about your participation, please feel free to contact Dr. Perilou Goddard: goddard@nku.edu.

Thank you very much for your help with this study. We sincerely appreciate your time and effort.