Identifying the Trajectory of Public Stigma Across the Stages of Recovery from a Substance Use Disorder

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Health Impact Statement: The public applies less stigma and has more positive reactions to people in recovery from a substance use disorder (SUD) than to those currently using drugs. The stigma is often similarly low regardless of how long someone has been in recovery, but certain stigmatizing attributes are still attached to those in early recovery more than to those in long-term recovery. More public education about what it means to be in recovery could lead to the public gaining an overall better understanding of this population and, ultimately, towards reducing the remaining stigma attached to those in recovery from a SUD.

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Abstract

Stigma felt by those with substance use disorders (SUDs) is both well documented and often a barrier to seeking treatment. This research was designed to better understand how stigma may change as people enter recovery and to document the trajectory of public stigma towards those in the three stages of recovery from a SUD (i.e., early, sustained, long-term). Participants (N = 187) were randomly assigned to read one of five brief vignettes about the life events a person who: (1) had no history of a SUD, (2) was currently using heroin, or was in (3) early recovery - 6 months, (4) sustained recovery - 2 years, or (5) long-term recovery - 5 years. Findings from this study revealed that public stigmatization is frequently lower for those in recovery from a SUD than for those currently using, and that stigma is similar across all three stages of recovery. Several factors of public stigma (i.e., bad character traits, support of discrimination) were less-strongly endorsed across all recovery stages, while endorsement of other stigma factors (i.e., perceptions of worthlessness or criminality) was higher in early recovery than in long-term recovery. Alternately, endorsement of good character traits and hopeful emotional reactions were quite high in early recovery and beyond. Obtaining a better understanding of how public stigmatization changes when directed at individuals at different stages of SUD recovery can help focus efforts on decreasing the remaining stigma.

Keywords: Public Stigma, Substance Use Disorder, Recovery, Traits, Discrimination

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Across the U.S., individuals, families, communities, and healthcare providers struggle to cope with the impacts of the opioid epidemic. According to the Centers for Disease Control and Prevention [CDC] (2022), more than 932,000 individuals have lost their lives to a drug overdose since 1999, with 82% of those deaths involving the use of an opioid (e.g., prescription drugs, heroin, fentanyl). This highlights the need to address the "treatment gap" in that a majority of individuals with SUDs, and opioid use disorders specifically, receive no treatment and face barriers if they try to seek treatment (Connery et al., 2020; Saini et al., 2022).

Although estimates vary, approximately 9.1% of U.S. adults (22.35 million) report having resolved an alcohol or substance use problem, with just less than half of these adults self-identifying as being "in recovery" (Kelly et al., 2017). Recovery occurs when people significantly and sustainably change their prior problematic substance use and experience general improvements in health, social functioning, well-being, and sense of purpose (Kelly & Hoeppner, 2015; Martinelli et al., 2020; Witkiewitz et al., 2020). Many experts specifically state that abstinence and/or absence of a substance use disorder (SUD) symptoms alone is an insufficient definition of recovery (Betty Ford Institute [BFI], 2007; Martinelli et al., 2020; UK Drug Policy, 2008; Witkiewitz et al., 2020).

Recovery is widely understood as a gradual and long-term process rather than a single event (Ashford et al., 2019a; BFI, 2007; UK Drug Policy, 2008). Additionally, those in recovery report multiple pathways to achieving recovery. This can include the use of mutual help organizations such as narcotics anonymous (NA), formal treatment interventions, FDA-approved medications for alcohol and opioid use disorder, faith-based recovery services, sober living

environments, and other community supports, while many others achieve recovery without any of these services (Kelly et al., 2017).

Previous work has frequently identified three stages of the recovery process (e.g., BFI, 2007; Martinelli, 2020; Melemis, 2015; O'Sullivan et al., 2019). Although there are some variations in the stage names, length of time spent in each stage, and observations of behaviors and achievements made at each stage, there is still quite a bit of overlap and agreement. One common stage model comes from the Betty Ford Institute Consensus Panel (2007) which lists the stages as: (1) Early Recovery as 1 month-1 year, (2) Sustained Recovery as 1-5 years, and (3) Long-Term Recovery as 5 or more years. A critical observation is that, while many definitions include abstinence from substance use as a criterion for recovery (e.g., BFI, 2007), others such as the UK Drug Policy Commission Recovery Census Group (2008) and The Recovery Science Research Collaborative (Ashford et al., 2019a) suggest that abstinence is not a necessary element of recovery. For example, "voluntarily sustained control over substance use" (UK Drug Policy, 2008) may be sufficient if other functioning and well-being have improved. Research examining changes in functioning across the BFI stages of recovery find that personal strengths, well-being, working at a job, or attending education each tend to increase while housing problems and involvement in crimes tend to decrease across the stages (Best et al., 2020; Martinelli et al., 2020). However, barriers to recovery still remain (Best et al., 2020).

Among those who perceive a need for SUD treatment, there are multiple barriers to seeking treatment including factors such as access, affordability, and their own readiness to quit (Saini et al., 2022). Another barrier is stigma, which can be defined as the application of negative attributes, labels, and stereotypes to people with a socially devalued identity or behavior (Earnshaw, 2020; Vilsaint et al., 2020). Stigma leads to the separation, mistreatment, or

reduction of status of those with the stigmatized identity. The stigmatization of those with SUDs may lead to feelings of shame, guilt, or fear among individuals who want to receive treatment but do not want to be stigmatized by others (Earnshaw, 2020; Saini et al., 2022). For example, perceptions of being stigmatized was associated with a decreased likelihood of utilizing treatment services among a sample of individuals with alcohol use disorder (Keyes et al., 2010). Ongoing public stigmatization of SUDs combined with these other barriers reinforces this population's vulnerability and places them at risk for continued substance use (Earnshaw, 2020; van Boekel et al., 2013; Yang et al., 2017). Specifically, individuals may continue to engage in substance use as a means to cope with feelings of shame from being stigmatized (Earnshaw et al., 2019). Although much research has examined stigmatization of individuals with SUDs (for reviews see Earnshaw, 2020; van Boekel et al., 2013; Yang et al., 2017), less has focused on stigma towards those in the different stages of recovery from SUDs. Therefore, the goal of this research is to better understand the trajectory of public stigma towards those in the three stages of recovery from a SUD.

Building from work in social psychology, researchers have theoretically conceptualized stigma as having three main dimensions: attributes and labels assigned to the individual (often called stereotypes), negative emotional feelings or reactions towards the individual (often called prejudice), and discriminatory behaviors towards the individual (harmful behaviors or reduction of status, Earnshaw et al., 2013; Nieweglowski et al., 2019; Yang et al., 2017).

Research about public stigma towards people with SUDs finds evidence for stigma in all three dimensions. In terms of negative attributes, those with SUDs are stereotyped by the public to have both low warmth and low competence (Cuddy et al., 2008). More specifically, people with SUDs are associated with attributes such as reckless, threatening, unpredictable, unreliable,

immoral, unable to make decisions about their finances or treatment, and responsible for their condition (Nieweglowski et al., 2019; Perry et al., 2020; Yang et al., 2017). They are also associated with labels such as junkie, dope fiend, or criminal (Ashford, 2019b). Similarly, healthcare providers often report that they perceive people with SUDs as aggressive, irresponsible, manipulative, unmotivated, and may be more to blame for their condition than other patients (van Boekel et al., 2013).

Endorsement of negative attributes can lead to negative emotional feelings towards individuals with SUDs. The public feels a range of negative emotions towards those with SUDs including fear, anger, and dread, along with sympathetic emotions such as pity (Nieweglowski et al., 2019; Yang, 2017). Healthcare providers were found to frequently hold negative attitudes towards those with SUDs including lower overall regard, less empathy, and less personal motivation to work with these clients (van Boekel et al., 2013).

Discriminatory behaviors occur when separating, status reducing, invalidating, or other harmful behaviors are directed toward a person with a SUD. Individuals with SUDs have reported experiencing poor or cold treatment from healthcare providers, being mistreated or simply not being hired by employers, and being ignored or rejected by their family and friends (Earnshaw, 2020). Other research finds that much of the public is unwilling to be a neighbor or a friend, work closely with, or have someone with a SUD marry into their family (McGinty et al., 2015; Perry et al., 2020). The public are more willing to deny them an apartment or services, watch them closely in expectation that they will behave poorly, and to give them fewer opportunities or chances than other people (Nieweglowski et al., 2019).These experiences of discrimination serve to destabilize recovery efforts and hinder individuals from entering SUD treatment or continuing treatment (Vilsaint et al. 2020).

A growing area of research has focused on people in recovery from SUDs to better understand the stigma they face. Individuals frequently seek out peer support systems (e.g., Narcotics Anonymous, online forums such as Reddit) to disclose and manage their experiences of stigma. Although these systems can be supportive, other members in recovery can sometimes impose intra-group stigma (Gunn & Canada, 2015; Kepner et al., 2022). For example, those who use prescribed medications to manage their SUD may be questioned by others who insist on abstinence (Kepner et al., 2022), and individuals may be judged as more or less worthy of treatment depending upon the specific drugs they used (Gunn & Canada, 2015).

Individuals in recovery also report experiencing or fearing stigma from family, friends, coworkers, employers, healthcare professionals, government agencies, and pharmacists (Burgess et al., 2021; Earnshaw et al., 2013; Earnshaw et al., 2019; Medina et al., 2022). These experiences can be stressful and reduce feelings of social support, making recovery more difficult (Earnshaw et al., 2013). This can also lead to fear to disclose their recovery status, and the desire to maintain secrecy can reduce their likelihood of seeking or continuing treatment (Burgess et al., 2021; Earnshaw et al., 2019). However, there is some evidence that educating healthcare professionals and the public about SUDs from the perspective of individuals in recovery who have lived experience can help reduce stigma (Bakos-Block et al., 2022; Bielenberg et al., 2021; Murphy & Russell, 2022).

One study specifically compared differences in public attitudes aimed at a person with an active SUD compared to someone in recovery from a SUD (McGinty et al., 2015). Participants who read a hypothetical vignette about someone in recovery from a heroin SUD were less likely to endorse social distancing discrimination than those who read about someone currently using heroin. This provides some evidence that the public may apply less stigma to those in recovery

than towards those actively using opioids. We aim to build on this study by using a similar methodology but including multiple conditions representing the different stages of recovery.

Some research has focused on trying to identify better, less stigmatizing terminology for people with SUDs. For example, individuals in recovery, their family members, and health care professionals generally agree that we should be using positive and neutral labels like *person in recovery, person with a substance use disorder,* and *person/human being* compared to more stigmatizing labels such as *junkie, addict*, or *drug abuser* (Ashford et al., 2019b). Therefore, in our study, we include both stigmatizing and non-stigmatizing attributes and labels to examine how much the public endorses each.

The Current Study

The current study was designed as a vignette experiment to replicate and extend findings from McGinty et al. (2015). We expanded their study by including five separate conditions: (1) control condition including an individual who never had a SUD, (2) current use condition including an individual who is actively using heroin, and three recovery conditions representing an individual in (3) early recovery, (4) sustained recovery, or (5) long-term recovery from a heroin SUD. This allowed us to examine if stigma declines across these stages of recovery. We also include a wide range of outcome measures to represent all three dimensions of public stigma: attributes, emotional reactions, and discriminatory behaviors, based on the work by Nieweglowski et al. (2019) on identifying specific factors of stigma towards those with SUDs. Acknowledging the work of Ashford et al. (2019b), we also examine how neutral and positive attributes and emotional reactions may change across the stages of recovery.

Although there is little prior research on how public stigmatization towards people in recovery differs from those currently using substances, one study found less endorsement of

discrimination towards those in treatment for a SUD than towards those actively using heroin (McGinity et al., 2015). Theoretically, stigma should decline as people progress through the stages of recovery, since someone in a later stage is further from the socially devalued behavior of substance use. At the same time, as stigma declines, we expect that neutral or positive responses would increase to replace the negative, stigma-related responses.

Therefore, we hypothesize that (1a) participants' endorsement of negative attributes, emotional reactions, and discriminatory behaviors will be highest in the current use condition and lowest in the control condition. (1b) Endorsement will be progressively lower for those presented with an individual in early, sustained, and long-term recovery. (1c) Endorsement in the long-term recovery condition will be significantly lower than the current use condition, but not significantly differ from the control condition.

We also hypothesized that (2a) participants' endorsement of neutral or positive attributes and emotional reactions will be lowest in the current use condition and highest in the control condition. (2b) Endorsement will be progressively higher for those presented with an individual in early, sustained, and long-term recovery. (2c) Endorsement in the long-term recovery condition will be significantly higher than the current use condition, but not significantly differ from the control condition.

Methods

Participants

A sample of $N = 203$ participants were recruited via two different online platforms from November 2021 through February 2022: Prolific ($N = 110$) and the (name of college) participant pool ($N = 93$). Prolific recruits received $1.65 compensation and participant pool recruits received partial course credit. Participants that completed less than one full set of questionnaires

(N = 18) were removed leaving N =185.[1] Sensitivity analysis conducted on G-Power indicated that with 80% power, an ANOVA with five conditions and a sample size of N = 185 would detect a medium-sized effect f^2 = .25 (Kang, 2021). The sample included 64% women, 31% men, and 2% non-binary or gender fluid individuals. Participants were generally young, with ages ranging from 18-79 years old (M = 26.56 years, SD = 10.82). Participants were 65% White, 11% Hispanic, 9% Black, 5% Asian, 0.5% American Indian, and 8% reported multiple racial/ethnic identities.

Study Design

The between-subjects experiment was conducted on Qualtrics using vignettes to examine how an individual in each of the three stages of recovery is perceived differently than an individual currently using heroin or someone with no history of SUD. Participants provided informed consent on the first page of the online study, and then were randomly assigned to read one version of five different vignettes: control (N = 31), current use (N = 38), early recovery (N = 38), sustained recovery (N = 40), and long-term recovery (N = 38). Immediately after reading the vignette, participants responded to a manipulation check question, then completed a series of questionnaires assessing the three dimensions of stigma. The study was approved by the (name of college) IRB.

[1] Independent sample t-tests and chi-square tests of independence were conducted to compare participants recruited from the two platforms. Participants recruited from Prolific were significantly older and included a greater percentage of men and of White individuals than the college sample. However, there were no statistically significant differences in how those recruited from each platform rated any of the DVs. Therefore, they were combined into one sample. Additionally, N = 17 participants either missed a manipulation check or an attention check question. We conducted the main statistical analyses (Kruskal Wallis tests & post-hoc tests) on both the smaller (N = 168) and larger datasets (N = 185). Very few changes in statistical significance in post-hoc tests were observed, so the N = 185 dataset analyses are reported.

The analysis plan involved two stages. First, exploratory factor analyses were conducted on the items representing the three dimensions of stigma. We predicted the items should cluster into meaningful factors, similar to those identified by Nieweglowski et al. (2019). However, since additional items, such as neutral and positive attributes, were included on these questionnaires, we expected the factors would likely differ somewhat from past research. Next, hypotheses were tested by conducting analyses to compare all five experimental conditions on each of the stigma factors. Study materials, de-identified data, and analysis code are available here: https://osf.io/agwem/

Vignette Conditions

The vignettes were adapted from three vignettes in McGinty et al. (2015) that were used to describe an individual with no history of a SUD, someone currently using heroin, and someone in recovery from heroin SUD. We significantly edited the recovery vignette to create three different versions representing the three stages of recovery. Full versions of vignettes are available in the supplemental material.

All vignettes tell a brief story about a white woman named Mary who has completed college. We decided upon using this relatively privileged identity to ensure that her SUD was the main source of stigma that participants would react to. (1) The control condition states that she has overcome typical life challenges. She works at a local store, lives with her family, and enjoys engaging with nature and the community. This story ends by stating that Mary has never used drugs. (2) The current use condition describes Mary's life after college, focusing on how her functioning has been severely impaired since she regularly started using heroin over the prior 6 months. It describes her financial difficulties, experiences of withdrawal, and problems with maintaining relationships with family and friends.

The three recovery conditions contain the same paragraph as the current use condition, along with an additional paragraph to describe how Mary's family convinced her to see a doctor and she entered a detox program. She has since started taking medication for opioid use disorder, works at a local store, lives with her family, and enjoys engaging with nature and the community. The vignette ends one of three ways: (3) Mary is in early recovery, has refrained from using heroin for 6 months, and her functioning has slightly improved since she began treatment; (4) Mary is in sustained recovery, has refrained from using heroin for 2 years, and her functioning has improved since she began treatment; or (5) Mary is in long-term recovery, has refrained from using heroin for 5 years, and her functioning has significantly improved since she began treatment.

After reading the vignette, participants wrote one to two sentences about Mary's life, and then responded to a multiple-choice manipulation check question where they could indicate that Mary was either: currently using heroin, never used drugs, or was in recovery for 6 months, 2 years, or 5 years.

Outcome Measures: Three Dimensions of Stigma

The outcome measures assessed how much the participant: 1) endorsed stigmatizing (negative) and non-stigmatizing (positive) attributes and labels about Mary, 2) felt negative and positive emotional reactions to Mary, and 3) supported discriminatory behaviors towards Mary. Two attention check questions were also randomly included among the outcome items.

Attributes. Participants read 60 statements about Mary in a random order that included attributes and labels commonly used to describe individuals with SUDs (heretofore all referred to as "attributes"). All 38 negative attributes were derived from previous research examining SUD stigma (Ashford et al., 2019b; Nieweglowski et al., 2019). Of the 22 neutral and positive

attributes, 16 also came from previous SUD stigma research (Ashford et al., 2019b) while six were added to expand the positive attributes. Participants indicated their agreement to each statement on a scale from (1) strongly disagree to (5) strongly agree.

An exploratory factor analysis (EFA) was conducted on the 60 attributes, similar to the analysis conducted by Nieweglowski et al., (2019) to identify main factors. When using a maximum likelihood factor analysis with promax rotation and eigenvalues greater than 1 as a criterion, eight factors accounted for 68.51% of the total variance. Fifty-one items loaded onto the eight factors when using a factor loading cutoff of .40 (see Table S1 in the supplemental material for full EFA information). Once factors were identified, items were averaged to obtain a total score for each factor (See Table 1 for full details about each factor). The factor scales are: (1) Substance use disorder (SUD), $\alpha = .96$, (2) Recovery, $\alpha = .94$, (3) Abstinence, $\alpha = .88$, (4) Slander, $\alpha = .83$, (5) Bad character, $\alpha = .90$, (6) Worthless, $\alpha = .85$, (7) Criminality, $\alpha = .77$, and (8) Good character, $\alpha = .90$.

Emotional Reactions. Participants were then asked to rate the extent to which they felt each of 12 different emotions towards Mary. Ten of the 12 items were derived from Nieweglowski et al. (2019) and the others were added to include some positively valenced emotions. Participants indicated how much they felt each emotion on a scale from (1) not at all to (4) to a great extent. A similar EFA was conducted on the 12 emotional reaction items, which resulted in three factors that accounted for 64.52% of the total variance (see Table S2 in the supplemental material). Once factors were identified, items were averaged to obtain a total score for each factor (See Table 1). The factor scales are: (1) Antipathy, $\alpha = .83$, (2) Sympathy, $\alpha = .84$, and (3) Hopeful, $\alpha = .65$.

Discriminatory Behaviors. Participants then read 15 statements about discriminatory actions that could be taken against Mary and indicated their agreement that each action should be taken on a scale from (1) strongly disagree to (5) strongly agree. Fourteen of the discriminatory behaviors were derived from previous SUD stigma research (McGinty et al., 2015; Nieweglowski et al., 2019) and one item was created by the researchers. A similar EFA was conducted on the 15 discrimination items, which resulted in two factors that accounted for 64.28% of the total variance (see Table S3 in the supplemental material). Once factors were identified, items were averaged to obtain a total score for each factor (See Table 1). The factor scales are: (1) Discrimination, $\alpha = .90$, and (2) Dehumanization, $\alpha = .90$.

Results

Data was analyzed with SPSS utilizing the nonparametric Kruskal Wallis H-test, since the data violated the assumption of homogeneity of variances across the different experimental conditions. Specifically, the control condition or current use condition tended to have less variability in outcome measure scores than the three recovery conditions. The H-test detects differences between groups by comparing variations among ranked sample means (Chan & Walmsley, 1997).

Separate Kruskal Wallis H-tests were conducted for each of the 13 outcome factors (see Table 2). All 13 tests were statistically significant, indicating that there were at least some differences between conditions for each outcome variable. Dunn's post hoc tests were then used to examine specific differences between the five conditions, with *p*-values adjusted using Bonferroni's method to control for multiple tests (adjusted *p*-value < .001). Figures 1 and 2 contain box plots that illustrate participants' response patterns.

Attributes

Results for the more negative label-focused attribute factors (including SUD and slander) partially supported the hypotheses (see Figures 1.1 and 1.2). As predicted, endorsement of SUD and slander attributes was highest in the current use condition and lowest in the control condition. Endorsement in the three recovery conditions was almost always significantly lower than the current use condition, but also almost always higher than the control condition. Contrary to the hypothesis, SUD and slander labels tended to remain somewhat associated with those in long-term recovery, albeit at a lower level. For the more neutral label-focused attributes (including recovery and abstinence), the hypotheses again were partially supported (see Figures 1.3 and 1.4). These attributes were endorsed in the three recovery conditions more than in the current use condition, and abstinence endorsement did not differ between the recovery conditions and the control condition. Participants tended to assign recovery and abstinence labels equally to those in all three stages of recovery.

When examining the more character-focused factors, results from the worthless and criminality factors revealed similar patterns that most closely matched the initial hypotheses (see Figures 1.5 and 1.6). Worthlessness was still endorsed for the early and sustained recovery conditions, with long-term recovery the only condition significantly lower than the current use condition. Criminality was still endorsed for the early recovery condition but was significantly lower than current use in the sustained recovery and long-term recovery conditions. For both the worthless and criminality factors, the recovery stages did not significantly differ from each other, but long-term recovery was low enough that it did not differ from the control condition.

Results from the bad character factor (see Figure 2.1) followed a slightly different pattern. Bad character endorsement was significantly higher in the current use condition relative to all other conditions, indicating that endorsement of bad character attributes for those in any

stage of recovery is low and at a similar level to those who have never used drugs. Interestingly, responses to the good character factor (see Figure 2.2) mirrored this pattern, but in the opposite direction. Good character attributes were significantly lower in the current use condition relative to all other conditions. In both cases, contrary to the hypotheses, stigma did not differ across the stages of recovery. Instead, bad characteristics were low and good characteristics were high for those in all three recovery stages.

Emotional Reactions

Both antipathy and sympathy reactions did not match the hypotheses. For both, recovery did not lead to a significant change compared to current use. Antipathy was significantly higher in the current use condition than the control condition, but the three recovery conditions fell in the middle and did not significantly differ from either control or current use (see Figure 2.3). For the sympathy factor (see Figure 2.4), participants reported the least sympathy in the control condition, significantly more in the current use condition, with the three recovery conditions falling a bit lower, but not significantly less than current use.

Results for the hopeful factor (see Figure 2.5) instead revealed a pattern similar to the good character factor. Participants reported feeling significantly more hopeful in all three recovery conditions than the current use condition. The positive emotional reactions did not differ across the stages of recovery, indicating a boost in hopeful emotions for all three stages.

Discriminatory Behaviors

Although the overall Kruskal Wallis test for the dehumanization factor indicated $p = .001$, the post-hoc tests with Bonferroni adjusted p-values did not reveal any significant differences between conditions. For discrimination (see Figure 2.6), those in the current use condition reported significantly higher endorsement than all other conditions. These results are

similar to those observed for the bad character attributes, indicating low endorsement of discrimination behaviors for all stages of recovery.

Discussion

The current study provides evidence that public stigmatization is frequently lower for those in recovery from a SUD than for those currently using, and that the stigma is often similar across the three stages of recovery. The extent to which stigma differs for those in recovery depends on the specific attribute, emotional reaction, or discriminatory behavior assessed. When making attributions about someone's bad character or deciding whether discrimination is acceptable, stigma is low for those at all stages of recovery, and is similar to someone who has never used drugs. However, when making attributions about how worthless or criminal an individual is, stigma is lowest for those in long-term recovery. Results offer additional evidence that stigma may frequently be lower for those in recovery than for those actively using drugs (McGinty et al., 2015), and when there are occasionally differences between the stages of recovery, stigma is lowest for those in long term recovery.

For some factors, the stigma remains. Negative emotional reactions of antipathy are similar toward those in recovery and those currently using drugs. When deciding whether slanderous terms such as "junkie" are appropriate, the public's endorsement tends to be lower for those in recovery than those currently using, but the terms are still somewhat endorsed. There is a similar pattern for the SUD factor, which includes a mix of neutral and stigmatizing labels. This seems important since those in recovery report still experiencing stigma (Burgess et al., 2021; Earnshaw et al., 2013; Earnshaw et al., 2019; Medina et al., 2022) and there remains a "treatment gap" which is at least partially due to the fear of backlash and stigmatization people may receive for initiating treatment in the first place (Connery et al., 2020; Saini et al., 2022).

This study shows evidence that many of the labels used to describe someone with a SUD, some of which are quite stigmatizing, frequently remain associated with those in recovery.

A new insight from the current study is that the public believes that those in any of the three stages of recovery have the same level of good character traits as someone who never had a SUD. The public also experiences more hopeful emotional reactions towards those in recovery than towards those currently using. This indicates that when stigma is lower, the public may report more positive and hopeful reactions towards those in recovery, even at early stages.

Some factors led to more variability when the public was rating someone in the three stages of recovery than when rating someone actively using drugs or who had never used drugs (for example, see SUD factor Figure 1.1 and abstinence factor 1.4). It seems that some members of the public may be uncertain about which labels they should use or are preferred by those in recovery. Identifying less-stigmatizing labels to describe people with SUDs and then publicizing this language is important (Ashford et al., 2019b), otherwise the public may be left to continue using stigmatizing terminology even if they do not have ill intent. More public education about what it means to be in recovery could lead to better overall understanding of this population and ultimately produce a more consistent reduction in stigma towards those in recovery from SUDs.

Limitations and Future Directions

This study had several limitations. Although the sample size was sufficient to assess medium-sized effects, smaller differences between conditions may have been statistically significant with a larger sample. The endorsement of most stigma factors was quite low, perhaps due to the nature of the study where participants were rating an imaginary person they read about in a vignette. Stigma may be higher when facing a family member, friend, co-worker, or neighbor in recovery from a SUD. The researchers recruited both college students from a

Hispanic-Serving Institution and from a nationwide online platform. However, the final sample did skew towards more women, White, and younger individuals, and likely those who are more educated. Prolific participants also tend to skew younger and more educated than the U.S. population (Eyal et al., 2021). It is possible that young, educated, women Americans are less likely to endorse stigma about those in recovery from SUDs than the broader U.S. population, potentially limiting the findings' generalizability.

Participants were not asked if they had any experience with people in recovery from SUDs. Since 9.1% of U.S. adults report having resolved an alcohol or substance use problem (Kelly et al., 2017), it is likely that much of the U.S. public has some experience with SUD recovery, and so any assessment of public stigmatization will include many people with and without personal experiences to shape their views. Future research could investigate if those with personal experience differ in stigma endorsement from those who do not.

The vignettes all focused on a White, college educated woman named Mary, as was used in the vignettes of McGinty et al. (2015). Her privileged identity ensured that the main source of stigma was her SUD. However, this may help explain why participants responded with low stigma even at early stages of her recovery. Future research should examine if the public reports greater stigma towards those in recovery who are from less privileged backgrounds or if having multiple stigmatized identities alters the quick stigma reduction following recovery observed here. The vignettes also only focus on recovery from heroin use, and so these findings may not generalize to those who are in recovery for alcohol or other substance use.

In addition, the vignettes manipulated the three stages of recovery by clearly stating the name of the stage, how long Mary had abstained from using heroin, and how much her functioning had improved. The vignettes were designed this way to ensure a strong

manipulation, so the participant was clear about which stage of recovery they were reading about. However, since all factors were manipulated simultaneously, it is not clear if one of these recovery factors (label, length of time, amount of functioning) is driving the observed effects more than the others. On the other hand, the three recovery conditions were very similar to the control condition in the way her current life was described: she lives with her family, enjoys time outdoors and joins community activities. Since this was not included in the current use condition, it may help explain why stigma was generally higher in this condition. Alternately, since there were few changes in the details describing her daily life across the three recovery conditions, this may help explain why participants frequently reacted to all recovery conditions with a similar stigma response. Future experimental research could utilize different vignettes to examine how much these details of the vignette alter stigma. Additionally, specific milestones such as improved mental health, less toxic social/environmental contexts, increase in economic status, and improvements in overall well-being could be examined to see if altering these factors, rather than just the recovery stage name and length, is more relevant for reducing public stigma (Best et al., 2020; Martinelli et al., 2020). This seems particularly important as more organizations state that abstinence is not a necessary requirement of recovery (Ashford et al., 2019a; UK Drug Policy, 2008).

Implications and Real-World Application

Advances in research on recovery from a SUD can improve the quality and accessibility of treatment and intervention efforts. Better understanding of how public stigmatization changes when directed at individuals in different stages of recovery can help focus efforts on decreasing the remaining stigma. We find that while some types of stigma are meaningfully lower for those even in the early recovery stage, other types of stigma are not reduced until later recovery stages,

if at all. This indicates areas where more public education is needed. Anti-stigma campaigns can focus on emphasizing our common humanity, each person's inherent value, and how those in recovery from SUDs are important to their family, friends, and communities. Education about which SUD terminology is the best to use could also reduce the public's reliance on stigmatizing labels that were previously quite common.

Additionally, we find that good character attributes and hopeful emotional reactions are high even in the early recovery stage. These factors could be included as part of education or intervention efforts or public service messaging aimed at reducing stigma, since these ideas already resonate well with many members of the public. Beyond public service messaging and education campaigns, it would also be helpful for the news media to more carefully choose language when describing individuals in recovery and for TV shows to offer less stigmatizing framing and storylines for characters with SUDs (Atayde et al., 2021; McGinty et al., 2019). The more the public sees individuals entering treatment, maintaining recovery, and living full lives, the less likely they will perpetuate ongoing stigmatization of individuals in recovery from SUDs.

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Table 1. *Descriptions of Items in Each of the Stigma Attributes, Emotional Reactions, and Discriminatory Behavior Factors*

Attributes	# of items	Description	Example items. Mary is…
SUD	14	Mix of neutral and some stigmatizing labels to describe people with SUD.	A person with SUD, Drug user, Substance abuser, Desperate for a fix
Recovery	5	Mostly neutral labels for those in recovery	Recovering from substance use, A recovering addict, A person in recovery, A survivor
Abstinence	3	Mostly neutral labels about abstinence	Substance free, Sober, Abstinent from drugs
Slander	3	Highly stigmatizing and demeaning labels for people with SUD	A junkie, A dope fiend, A crackhead
Bad Character	10	Range of stigmatizing personality traits and attributes	Poor, Selfish, Impulsive, Blames others for her problems
Worthless	5	Stigmatizing attributes and labels focused on being less valuable than others to society	Worthless, Hopeless, A loser, A cheater
Criminality	3	Stigmatizing labels & attributes focused on criminality	A felon, A criminal, Reckless
Good Character	7	Range of positive personality traits and attributes	A hardworking person, A motivated person, An honest person, Strong
Emotional Reactions	# of items	Description	Example items. I feel ____ towards/about Mary
Antipathy	7	Negative feelings commonly reported toward those stigmatized by society	Disgust, Hatred, Anger, Fear
Sympathy	3	Feelings of sympathy and concern	Sadness, Worried, Pity
Hopeful	2	Feelings of optimism towards those who have overcome the challenges faced by a SUD	Hopeful, Inspired
Discriminatory Behaviors	# of items	Description	Example items.
Discrimination	8	Common discriminatory behaviors experienced by individuals with SUDs	I would not hire Mary as an employee, Mary should be watched more closely, It is okay to deny Mary an apartment for renting, I am willing to have Mary marry into my family (reversed)
Dehumanization	7	Beliefs and behaviors that dehumanize, indicating that someone deserves less than others	Mary does not deserve the same freedom as everyone else does, Mary does not deserve as many opportunities as everyone else is given, It is okay to dismiss Mary during conversation, It is okay to avoid Mary in public

Table 2. *Means, Standard Deviations, Mean Ranks, and Results of Kruskal Wallis Tests*

			Experimental Conditions							
Factors			Control	Current Use	Early Rec.	Sustained Rec.	Long-Term Rec.			
Attributes	*M*	*SD*	Mean Rank	Mean Rank	Mean Rank	Mean Rank	Mean Rank	*H*	*df*	*p*
SUD	3.10	1.16	19.47[a]	160.12[b]	101.15[c]	84.01[c]	81.68[c]	124.14	4	< .001
Slander	2.04	1.08	35.92[a]	141.76[b]	91.03[c]	96.14[b,c]	86.89[a,c]	71.31	4	< .001
Recovery	3.55	1.44	28.55[a]	39.74[a]	112.54[b]	121.91[b]	142.08[b]	134.97	4	< .001
Abstinence	3.40	1.36	123.18[a]	20.20[b]	96.34[a]	105.33[a]	116.47[a]	91.76	4	< .001
Worthless	1.72	0.73	85.61[a,b]	123.51[b]	91.32[a,b]	86.23[a,b]	70.30[a]	21.01	4	< .001
Criminality	2.14	0.93	69.53[a]	130.03[b]	97.42[a,b]	80.29[a]	77.58[a]	30.63	4	< .001
Bad Character	2.58	0.79	65.27[a]	147.24[b]	90.35[a]	80.80[a]	70.45[a]	56.79	4	< .001
Good Character	3.65	0.85	92.90[a]	24.78[b]	107.43[a]	106.96[a]	124.39[a]	80.89	4	< .001
Emotional Reactions	*M*	*SD*	Mean Rank	Mean Rank	Mean Rank	Mean Rank	Mean Rank	*H*	*df*	*p*
Antipathy	1.31	0.44	53.82[a]	124.38[b]	101.23[a,b]	93.75[a,b]	78.03[a,b]	37.39	4	<. 001
Sympathy	2.37	0.94	26.69[a]	134.77[b]	100.00[b]	95.29[b]	89.93[b]	74.18	4	< .001
Hopeful	2.76	0.87	92.77[a,b]	42.81[b]	105.85[a]	97.21[a]	118.59[a]	45.97	4	< .001
Discriminatory Behaviors	*M*	*SD*	Mean Rank	Mean Rank	Mean Rank	Mean Rank	Mean Rank	*H*	*df*	*p*
Dehumanization	1.53	0.71	79.55[a]	120.41[a]	84.00[a]	89.93[a]	73.58[a]	19.52	4	= .001
Discrimination	2.10	0.90	59.13[a]	150.51[b]	85.15[a]	84.09[a]	64.09[a]	70.71	4	< .001

Note: [a, b, c] indicates patterns among statistical significance between mean ranks for each factor. Mean ranks with the same superscript letter did not differ significantly between conditions, whereas mean ranks with differing superscript letters did differ significantly. Bonferroni adjusted significance, $p < .001$.

Figure 1. *Box Plots for Attributes with Significant Differences Between Conditions*

Figure 1.1 Attribute: SUD

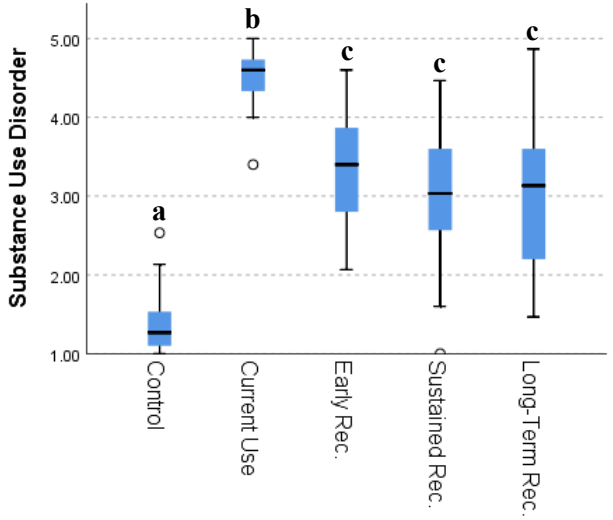


Figure 1.2 Attribute: Slander

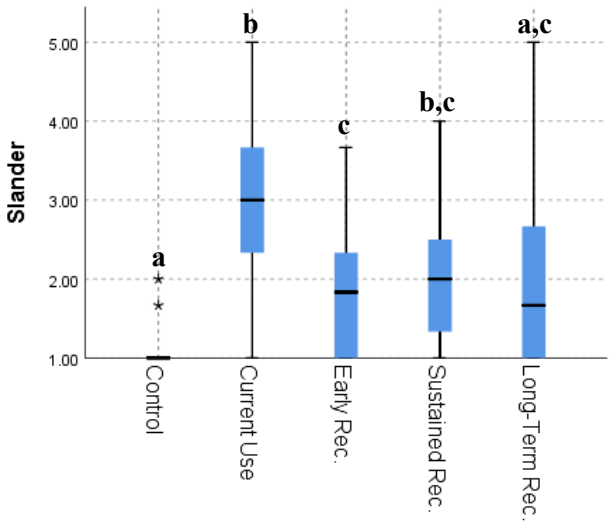


Figure 1.3 Attribute: Recovery

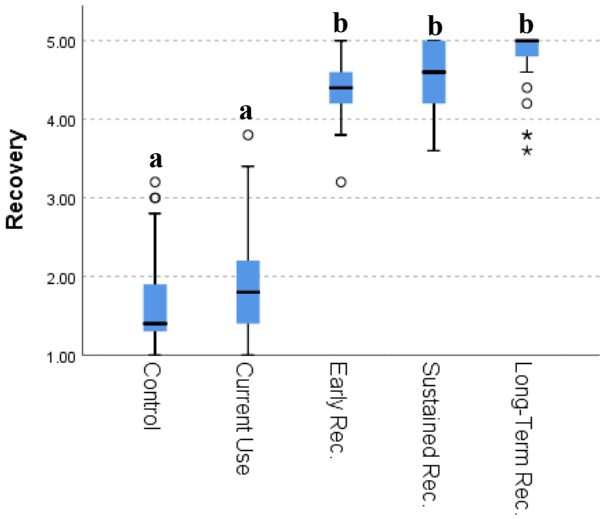


Figure 1.4 Attribute: Abstinence

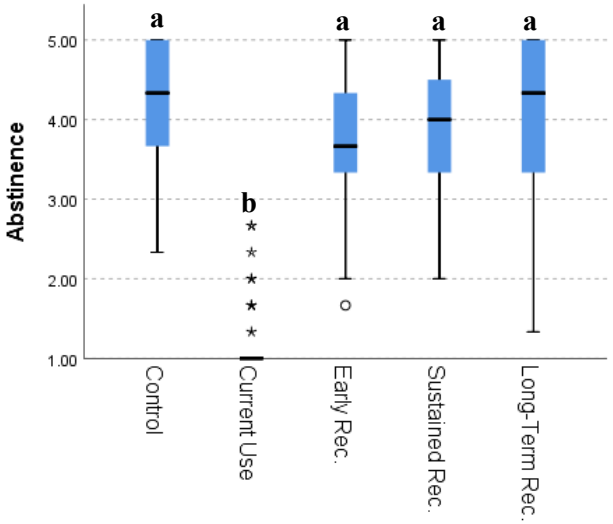


Figure 1.5 Attribute: Worthless

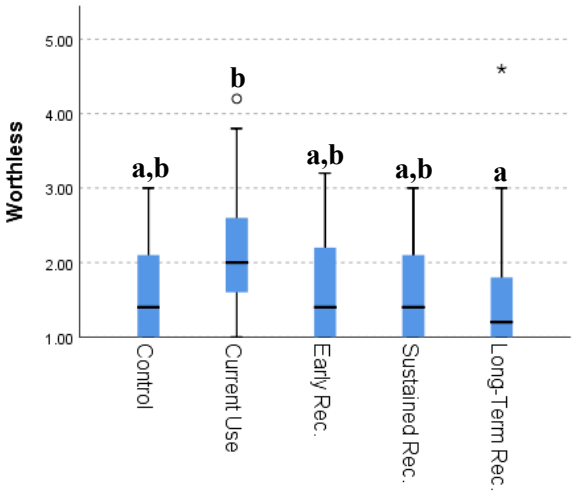
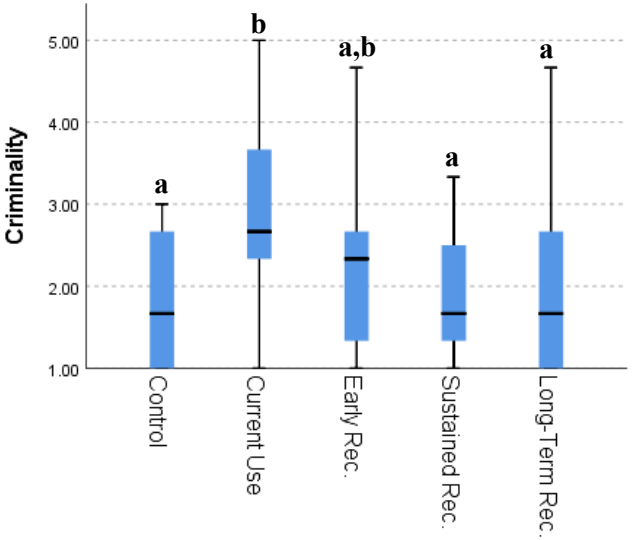


Figure 1.6 Attribute: Criminality



Note: The blue box represents the interquartile range, with the top of the blue box representing the 75th quartile and the bottom of the box representing the 25th quartile. The black line represents the median or 50th quartile. Whiskers on the top represent variability in responses for the upper quartile range and whiskers on the bottom represent variability in responses for the lower quartile range. o represents outliers in the sample, * represent extreme outliers. On the y-axis, 1 = low endorsement and 5 = high endorsement. [a, b, c] indicates patterns among statistical significance between mean ranks for each factor. Mean ranks with the same superscript letter did not differ significantly between conditions, whereas mean ranks with differing superscript letters did differ significantly. Bonferroni adjusted significance, $p < .001$.

Figure 2. *Box Plots for Remaining Attributes, Emotional Reactions, & Discriminatory Behaviors with Significant Differences Between Conditions*

Figure 2.1 Attribute: Bad Character

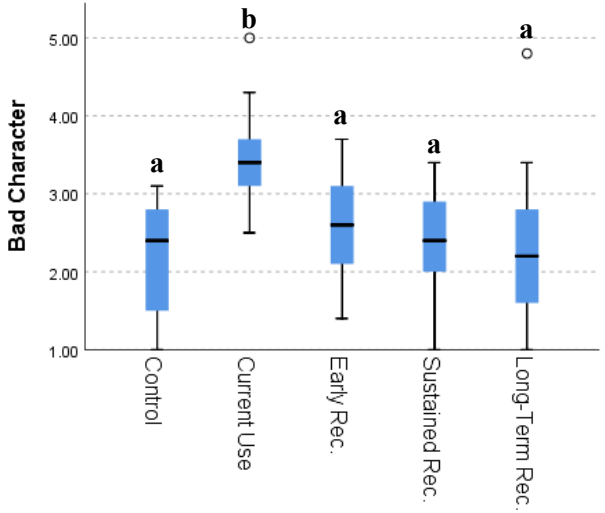


Figure 2.2 Attribute: Good Character

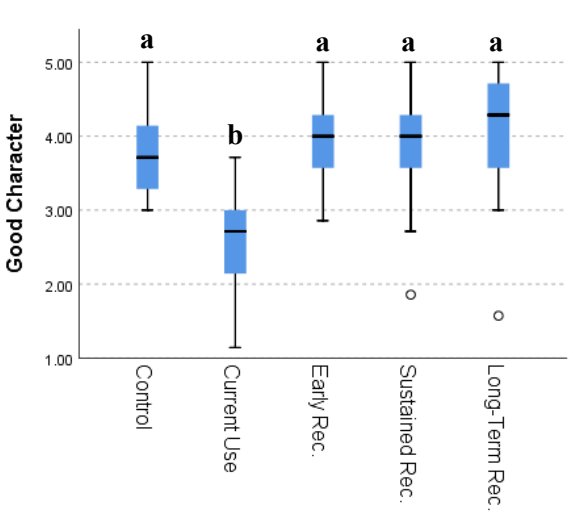


Figure 2.3 Emotional Reaction: Antipathy

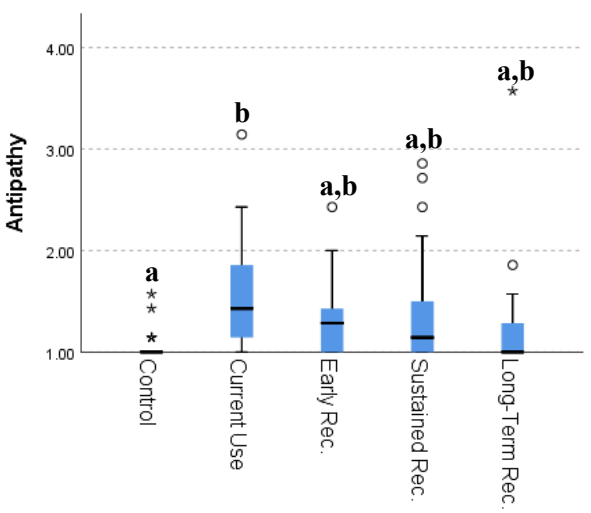


Figure 2.4 Emotional Reaction: Sympathy

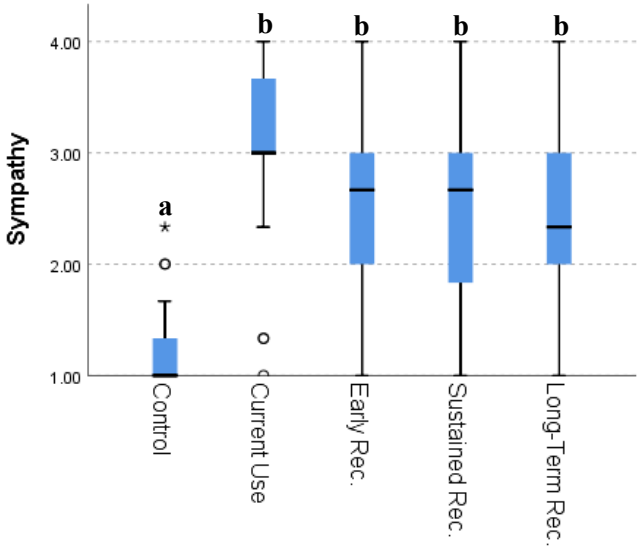


Figure 2.5 Emotional Reaction: Hopeful

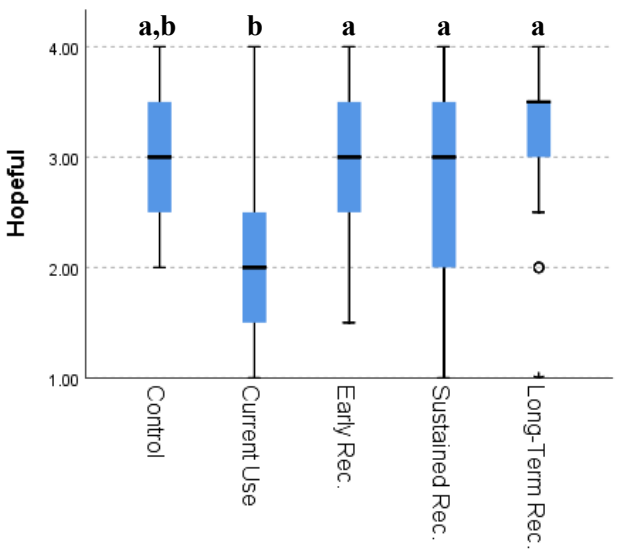
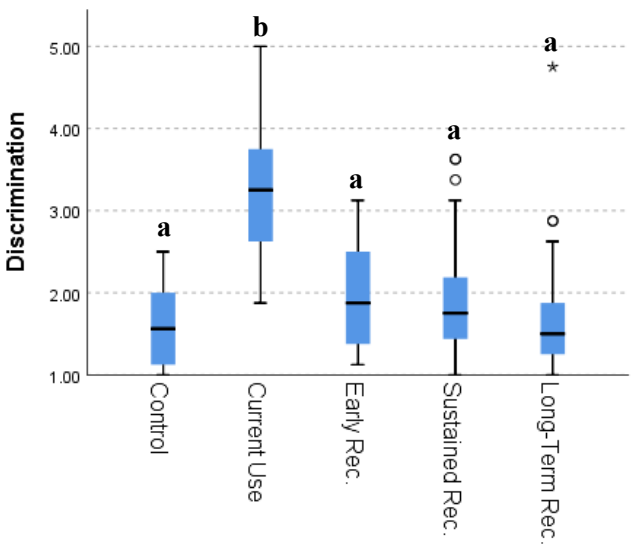


Figure 2.6 Discriminatory Behavior: Discrimination



Note: The blue box represents the interquartile range, with the top of the blue box representing the 75th quartile and the bottom of the box representing the 25th quartile. The black line represents the median or 50th quartile. Whiskers on the top represent variability in responses for the upper quartile range and whiskers on the bottom represent variability in responses for the lower quartile range. **o** represents outliers in the sample, * represent extreme outliers. On the y-axis, 1 = low endorsement and 5 = high endorsement. [a, b, c] indicates patterns among statistical significance between mean ranks for each factor. Mean ranks with the same superscript letter did not differ significantly between conditions, whereas mean ranks with differing superscript letters did differ significantly. Bonferroni adjusted significance, $p < .001$.

Supplemental Materials for "Identifying the Trajectory of Public Stigma Across the Stages of Recovery from a Substance Use Disorder"

Five Vignette for Experimental Conditions (adapted from McGinty et al., 2015)
Note: The primary manipulation of IV is italicized in each vignette

1) Control Condition:
Mary is a white woman who has completed college. She has experienced the usual ups and downs of life but managed to get through the challenges she has faced. Mary lives with her family and enjoys spending time outdoors and taking part in various activities in her community. She works at a local store. *Mary has never used drugs in her life even during her time away at college.*

2) Active Use Condition:
Mary is a white woman who has completed college. A year after college, Mary went to a party and used heroin for the first time. After that, she started using heroin more regularly. At first, she only used on weekends when she went to parties, but after a few weeks found that she increasingly felt the desire for more. *Mary then began using heroin nearly every day, sometimes Mary even used heroin multiple times a day.* She spent all of her savings and borrowed money from friends and family in order to buy more heroin. Each time she tried to cut down, she felt anxious and became sweaty and nauseated for hours on end and also could not sleep. These symptoms lasted until she resumed taking heroin. Her friends complained that she had become unreliable - making plans one day and canceling them the next. Her family said she had changed and that they could no longer count on her. She has been living this way for 6 months. *Mary currently has a substance use disorder and cannot stop using heroin. Mary's functioning in her day-to-day life has been significantly impacted because of her heroin use.*

3) Early Recovery Condition:
Mary is a white woman who has completed college. A year after college, Mary went to a party and used heroin for the first time. After that, she started using heroin more regularly. At first, she only used on weekends when she went to parties, but after a few weeks found that she increasingly felt the desire for more. *Mary then began using heroin nearly every day, sometimes Mary even used heroin multiple times a day.* She spent all of her savings and borrowed money from friends and family in order to buy more heroin. Each time she tried to cut down, she felt anxious and became sweaty and nauseated for hours on end and also could not sleep. These symptoms lasted until she resumed taking heroin. Her friends complained that she had become unreliable - making plans one day and canceling them the next. Her family said she had changed and that they could no longer count on her. She had been living this way for six months.

At that point, Mary's family encouraged her to see a doctor. With her doctor's help, she entered a detox program to address her problem. After completing detox, she started talking with a doctor regularly and began taking appropriate medication. After three months of treatment, she felt good enough to start searching for a job. Since then, Mary has received steady treatment and her symptoms have been under control for the past 6 months. She lives with her family and enjoys spending time outdoors and taking part in various activities in her community. Mary works at a local store. *Mary now identifies as being in stage one of the recovery process, early recovery and has refrained from using heroin for a total of 6 months. Mary's functioning in her day-to-day life has slightly increased since she began treatment for using heroin.*

4) Sustained Recovery Condition:
Mary is a white woman who has completed college. A year after college, Mary went to a party and used heroin for the first time. After that, she started using heroin more regularly. At first, she only used on weekends when she went to parties, but after a few weeks found that she increasingly felt the desire for more. *Mary then began using heroin nearly every day, sometimes Mary even used heroin multiple times a day.* She spent all of her savings and borrowed money from friends and family in order to buy more heroin. Each time she tried to cut

down, she felt anxious and became sweaty and nauseated for hours on end and also could not sleep. These symptoms lasted until she resumed taking heroin. Her friends complained that she had become unreliable - making plans one day and canceling them the next. Her family said she had changed and that they could no longer count on her. She had been living this way for six months.

At that point, Mary's family encouraged her to see a doctor. With her doctor's help, she entered a detox program to address her problem. After completing detox, she started talking with a doctor regularly and began taking appropriate medication. After three months of treatment, she felt good enough to start searching for a job. Since then, Mary has received steady treatment and her symptoms have been under control for the past two years. She lives with her family and enjoys spending time outdoors and taking part in various activities in her community. Mary works at a local store. *Mary now identifies as being in stage two of the recovery process, sustained recovery and has refrained from using heroin for a total of 2 years. Mary's functioning in her day-to-day life has increased since she began treatment for using heroin.*

5) Long-Term Recovery Condition:
Mary is a white woman who has completed college. A year after college, Mary went to a party and used heroin for the first time. After that, she started using heroin more regularly. At first, she only used on weekends when she went to parties, but after a few weeks found that she increasingly felt the desire for more. *Mary then began using heroin nearly every day, sometimes Mary even used heroin multiple times a day* She spent all of her savings and borrowed money from friends and family in order to buy more heroin. Each time she tried to cut down, she felt anxious and became sweaty and nauseated for hours on end and also could not sleep. These symptoms lasted until she resumed taking heroin. Her friends complained that she had become unreliable - making plans one day and canceling them the next. Her family said she had changed and that they could no longer count on her. She had been living this way for six months.

At that point, Mary's family encouraged her to see a doctor. With her doctor's help, she entered a detox program to address her problem. After completing detox, she started talking with a doctor regularly and began taking appropriate medication. After three months of treatment, she felt good enough to start searching for a job. Since then, Mary has received steady treatment and her symptoms have been under control for the past five years. She lives with her family and enjoys spending time outdoors and taking part in various activities in her community. Mary works at a local store. *Mary now identifies as being in stage three of the recovery process, long-term recovery and has refrained from using heroin for a total of 5 years. Mary's functioning in her day-to-day life has significantly increased since she began treatment for using heroin.*

Table S1. *Results from Exploratory Factor Analysis of Attributes*

Factors							
Substance Use Disorder		**Recovery**		**Bad Character**		**Worthless**	
Item	Factor loading	Item	Factor loading	Item	Factor loading	Item	Factor loading
Person with SUD	1.01	Recovering from substance use	1.00	Poor	0.80	Worthless	0.95
Person with HUD	0.98	Recovering addict	0.97	Selfish	0.69	Hopeless	0.74
Drug user	0.93	Person in recovery	0.95	Blames others for their problems	0.68	Loser	0.67
Person who uses drugs	0.86	Person in long-term recovery	0.82	Impulsive	0.66	Cheater	0.43
Substance abuser	0.85	Survivor	0.53	Is the one to blame for own problems	0.60	Inadequate person	0.41
Drug abuser	0.79			Liar	0.58		
Substance user	0.77			Dependent on others	0.56		
Recurrence of use	0.71			Uncontrollable	0.55		
Likely to relapse	0.59			Unpredictable	0.47		
Desperate for a fix	0.52			Self-destructive	0.43		
Free from addiction	-0.50						
Unreliable	0.47						
Drug-free person	-0.46						
Hit rock bottom	0.41						
Eigen-values	23.27		7.46		3.78		1.92
Cronbach's Alpha	0.96		0.94		0.90		0.85
Means (SD)	3.10 (1.16)		3.55 (1.44)		2.58 (0.79)		1.72 (0.73)

Note: *KMO* = .93; Bartlett's test of sphericity, $\chi^2(1830) = 9967.85$, $p < .001$.

Table S1. Continued:

Factors							
Good Character		**Criminality**		**Slander**		**Abstinence**	
Item	Factor loading	Item	Factor loading	Item	Factor loading	Item	Factor loading
Hardworking	-1.01	Felon	0.85	Junkie	0.80	Substance free	0.77
Motivated	-0.71	Criminal	0.83	Dope fiend	0.61	Sober	0.62
Honest	-0.64	Reckless	0.41	Crackhead	0.53	Abstinent from drugs	0.56
Hopeful	-0.55						
Clean	-0.51						
Strong	-0.44						
Takes responsibility for actions	-0.44						
Eigen-values	1.60		1.41		1.25		1.11
Cronbach's Alpha	0.90		0.77		0.83		0.88
Means (SD)	3.65 (0.85)		2.14 (0.93)		2.04 (1.08)		3.40 (1.36)

Table S2. *Results from Exploratory Factor Analysis of Emotional Reactions*

Factors					
Antipathy		**Sympathy**		**Hopeful**	
Item	Factor loading	Item	Factor loading	Item	Factor loading
Disgust	0.85	Sadness	0.90	Hopeful	1.00
Hatred	0.80	Worried	0.83	Inspired	0.48
Anger	0.78	Pity	0.69		
Paranoid	0.58				
Weary	0.53				
Fearful	0.52				
Resentment	0.51				
Eigen-values	4.53		2.01		1.20
Cronbach's Alpha	0.83		0.84		0.65
Means (SD)	1.31 (0.44)		2.37 (0.94)		2.76 (0.87)

Note: *KMO* = .82; Bartlett's test of sphericity, $\chi^2(66) = 874.87$, $p < .001$.

Table S3. *Results from Exploratory Factor Analysis of Discriminatory Behaviors*

Factors			
Discrimination		**Dehumanization**	
Item	Factor loading	Item	Factor loading
Not hire as employee	0.86	Not deserve same freedom as others	0.99
Lacks job potential	0.79	Not deserve as many opportunities as others	0.96
Should be watched more closely	0.78	Not deserve as many chances as others	0.78
Unable to keep job	0.78	Dismiss during conversation	0.61
Deny apartment for renting	0.72	Reject socially	0.57
Marry into family	-0.63	Avoid in public	0.47
Work closely with in office	-0.63	Think less of her because she used drugs	0.42
Ignore in public	0.42		
Eigen-values	8.07	1.57	
Cronbach's Alpha	0.90	0.90	
Means (SD)	2.10 (0.90)	1.53 (0.71)	

Note: *KMO* = .92; Bartlett's test of sphericity, $\chi^2(105) = 1867.35$, $p < .001$