The Relationship Between Access to Mental Health Resources and Use of Preferred Effective

Mental Health Treatment

Alexandra L. Silverman

Charlottesville, VA

Bachelor of Arts, Colgate University, 2014

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Committee Members:
Bethany Teachman, PhD
Noelle Hurd, PhD

Abstract

Objective: Certain marginalized groups do not have equal access to mental health resources. This study examined whether variables related to access to mental health resources (racial-ethnic group membership, education level, number of community-level treatment providers, and facilities) were associated with current mental health treatment use; and, whether they moderated the likelihood that individuals would receive their preferred effective treatment.

Methods: In a preregistered (osf.io/z28wr) online study, 5,626 individuals completed a mental health history form and measures of implicit and explicit beliefs about the effectiveness of therapy vs. medication. **Results:** Only individuals with higher education levels were more likely to report current use of treatment. Individuals who were Black/Latinx or who lived in a community with fewer treatment providers sometimes had a lower probability of accessing preferred effective treatment, though results varied across implicit and explicit measures.

Conclusions: Findings support initiatives to increase access to mental health resources among marginalized groups.

Keywords: mental health disparities, treatment preferences, treatment attitudes, implicit attitudes, treatment access

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While an estimated 46.6 million adults in the U.S. experienced a mental illness in 2017, nearly 60% of those individuals did not receive mental health services (NIMH, 2017). Lifetime estimates are even grimmer, with 50% of the U.S. population predicted to experience a mental illness in their lifetime, 70% whom will not receive needed services (Kazdin, 2017). The discrepancy between the number of people who experience a mental illness and the number of people who receive mental health services is often referred to as the treatment gap (Kazdin, 2017). Critically, the treatment gap hurts some groups disproportionately due to structural racism and classism, which ensure that certain marginalized groups do not have the same access to mental health resources as other groups (see Bailey, Krieger, Agénor, Graves, Linos, & Bassett, 2017; Compton, & Shim, 2015; Manseau, 2015). For example, mental health care use rates are lower among Black and Latinx individuals (Cook, Trinh, Li, Hou, & Progovac, 2016) who experience discrimination, health inequities, and structural inequality, and among individuals living in rural communities who have limited access to mental health treatment providers and facilities (Smalley et al., 2010). The goal of the present study is to examine how variables associated with unequal access to mental health resources are related to current treatment use and the likelihood of accessing one's preferred effective mental health treatment.

Using data collected among a large, diverse sample of visitors to a public website assessing implicit and explicit beliefs about the effectiveness of medication versus therapy, this study first seeks to replicate previous tests of whether racial-ethnic group membership, education level, number of community-level treatment providers, and number of community-level treatment facilities predict concurrent engagement in mental health treatment. Second, to investigate whether these variables predict whether or not individuals access the mental health treatment that aligns with their preferences, which has not been tested previously to our knowledge, we investigate whether the four variables moderate the relationship between

preferred effective mental health treatment (based on beliefs about the effectiveness of medication vs. therapy) and current use of mental health treatment (reported use of medication and/or therapy).

Measures of Unequal Access to Mental Health Resources

Four variables were selected given their connection to unequal access to mental health resources, each of which are reviewed here.

Racial-Ethnic Group Membership. Interpersonal and structural racism drive differences in lived experiences, including access to mental health resources (Bailey et al., 2017; Compton, & Shim, 2015). As such, racial-ethnic membership is used here as a proxy variable to capture differences in the lived experiences of Black and Latinx individuals in comparison to non-Latinx White individuals living in a racist society (Liu, 2017, Liu et al., 2019). The present study focuses specifically on Black and Latinx racial-ethnic group membership because significant disparities in access to mental health care have been identified among these two racial-ethnic groups in comparison to others (see Cook et al., 2019, for review). Both Black and Latinx individuals are less likely to access mental health services, less likely to receive needed treatment, and more likely to receive poor quality mental health treatment in comparison to non-Latinx White individuals (Cook et al., 2016, McGuire & Miranda, 2008, U.S. Department of Health and Human Services, 2013). In a nationally representative sample of U.S. adults between 2011 and 2012, the rate of access to mental health care and rate of use of psychotropic medication, respectively, was 10.8% and 10% lower among Black individuals, and 10.9% and 10.3% lower among Latinx individuals compared to non-Latinx White individuals (Cook et al., 2016).

Both structural and attitudinal factors contribute to racial and ethnic disparities in mental health care use (Cook et al., 2019). At the structural level, residential segregation has forced Black and Latinx individuals into neighborhoods that provide little access to mental health services and limited treatment options (Dinwiddie, Gaskin, Chan, Norrington, & McCleary, 2013; Gaskin, Dinwiddie, Chan, & McCleary, 2012). Racial and ethnic differences in health insurance

status and income that result from racist policies (i.e., Manseau, 2015) also contribute to

disparities in mental healthcare use. In comparison to non-Latinx White individuals, Black and

Latinx individuals are more likely to be uninsured or covered by Medicaid, and to have lower

incomes (Gaskin et al., 2012), which impedes their ability to afford mental healthcare.

Attitudinal factors further explain racial and ethnic disparities in use of mental health

treatment. Some mental healthcare providers have been found to use discriminatory or racist

practices with clients who hold marginalized racial and ethnic identities (McGuire & Miranda,

2008; Shin, Smith, Welch, & Ezeofor, 2016). In turn, Black and Latinx individuals may avoid

seeking out mental health treatment due to fear of provider-level discrimination (e.g., Gaston,

Earl, Nisanci, & Glomb, 2016). Further, marginalized racial and ethnic groups appear to be more

strongly deterred from help-seeking due to mental health stigma (both public and internalized

stigma) in comparison to non-Latinx White individuals (Clement et al., 2015). It is possible that

individuals from marginalized racial and ethnic groups may experience double stigma whereby

racism outside and within mental health services is combined with public and internalized

stigma of mental illness to deter help-seeking (Gary, 2005).

Education Level. A second variable, education level, is also linked to unequal access to

mental health resources. Though individuals with lower levels of education are more likely to

experience mental illness (e.g., Muntaner, Ng, Vanroelen, Christ, & Eaton, 2013), rates of

mental healthcare use are highest for individuals with high education levels (Steele, Dewa, Lin,

& Lee, 2007; Wang, Berglund, & Kessler, 2000). Less is understood about what causes the

disparities in mental health treatment use among individuals with lower education levels. One

proposed structural explanation for these disparities is that individuals with higher levels of

education generally come from, and/or obtain, higher socioeconomic status (SES) levels (U.S.

Department of Commerce, 2019), thus increasing their ability to afford mental health services.

However, evidence suggests that education, but not income level (another indicator of SES), is

independently associated with mental health service use (Alegría, Bijl, Lin, Walters, & Kessler,

2000; Steele et al., 2007). Thus, although education level and income are both indicators of SES, education appears to be a stronger and more consistent predictor of disparities in mental health service use, suggesting that factors beyond SES may help explain disparities in mental health treatment use among individuals with less education.

One attitudinal factor that is likely related to these disparities is the lack of mental health literacy among individuals with lower levels of education (Hanchate, Ash, Gazmararian, Wolf, & Paasche-Orlow, 2008). Lower levels of education are associated with impaired insight into and awareness of one's mental health difficulties, and impaired ability to attribute symptoms to a mental illness (Yen, Chen, Lee, Tang, Ko, & Yen, 2005), which in turn seems likely to reduce knowledge of treatment options (Jorm, 2012), motivation and ability to seek out mental health resources.

Number of Mental Health Treatment Providers and Facilities. Another means of quantifying unequal access to mental health resources is to measure the number of mental health treatment providers and facilities in an individual's community. It is expected that individuals living in communities with greater numbers of mental health providers and facilities will have greater ease of access to mental health treatment and more treatment options to choose from, which may aid in narrowing the treatment gap within these communities (Cook, Doksum, Chen, Carle, & Alegría, 2013). Additionally, living in communities with larger numbers of mental health specialists and treatment facilities may increase individuals' exposure to others who are seeking mental health treatment, which may reduce mental health stigma, and make treatment-seeking appear more normative and appealing.

Lower availability (proportionally) of mental health specialists and facilities is associated with higher neighborhood poverty levels (Chow, Jaffe, & Snowden, 2003), living in a racially segregated Black or Latinx community (Dinwiddie et al., 2013), and living in a rural (vs. urban) environment (Smalley et al., 2010), which demonstrate how structural racism and classism yield limited access to mental health resources. Further, because living in one community versus

another is likely related to both racial-ethnic group membership and education level, research is needed to investigate how these variables jointly influence individuals' access to mental health resources.

Treatment Attitude-Treatment Behavior Prediction and Implicit and Explicit Beliefs

In addition to looking at whether variables associated with unequal access to mental health resources predict whether or not someone is receiving treatment in general, we also need to examine whether these variables are related to whether or not individuals access their preferred effective form of treatment (based on implicit and explicit beliefs about the effectiveness of medication vs. therapy[1]). This is important given that clients who receive their preferred mental health treatment are less likely to drop out, and have better treatment outcomes and higher treatment satisfaction (Lindhiem, Bennett, Trentacoasta, & McLear, 2014). Notably, individuals' preferred effectiveness beliefs may be less associated with their medication and/or therapy use if they have limited access to mental health resources. For example, a depressed Black individual living in a predominantly Black neighborhood where there are significant shortages in mental health specialists (e.g., Gaskin et al., 2012) may choose to take an antidepressant prescribed by a general practitioner, rather than see a therapist who is located 60 miles away, despite a preference for the latter.

Importantly, treatment beliefs can be expressed both explicitly and implicitly (e.g., Rusch, Todd, Bodenhausen, Weiden, & Corrigan, 2009). The iterative reprocessing (IR) model, for instance, proposes that cognition exists along a continuum, from relatively automatic (implicit) evaluations that are based on only a few interpretative iterations (which may occur without conscious monitoring), to controlled (explicit) evaluations that occur as the stimuli is reprocessed through repeated interpretative iterations, producing a more carefully considered,

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[1] Notably, there are many contributors to treatment preferences, and beliefs about treatment effectiveness are not synonymous with preferences more broadly (hence, our use of the specifier "preferred effective"), but these beliefs were selected as an important component of preferences given they are foundational to preferred care (i.e., it does not make sense to prefer a treatment that you think will not help).

controlled evaluation (Cunningham & Zelazo, 2007). While considerable debate surrounds the specific nature and relationship between implicit and explicit attitudes, the current study will use the term implicit to denote mental representations that can be quickly and unintentionally used to inform evaluative judgments, that do not require conscious control, and that are measured using indirect methods that measure mental associations between objects and specific evaluation parameters. The term explicit will signify mental representations that are conscious, controlled, and reflective, and measured by asking individuals to self-report their agreement with statements on tailored metrics.

Measures of both explicit and implicit attitudes incrementally predict behavior (see meta-analysis by Kurdi et al., 2018), underscoring the usefulness of both types of measures. Beyond differential predictions of behavior, research has found that discrepancies between implicit and explicit attitudes lead to affective, cognitive, and behavioral consequences, including implicit ambivalence, and increases in information processing to reduce inconsistencies (Shoda, McConnell, & Rydell, 2014). This suggests that it is not only important to examine implicit and explicit beliefs, but also their interaction. In research on attitudes towards mental health treatment, implicit positive attitudes toward psychiatric medication significantly predicted higher levels of perceived need for treatment, while explicit positive attitudes toward psychiatric medication predicted current self-reported medication adherence (Rusch et al., 2009). Another study from our team measuring attitudes about the effectiveness of psychiatric medication vs. therapy (using some overlapping data with the dataset used in the current study, but not testing any of the same questions) found that individuals who had experience with a given treatment (medication or therapy) had stronger implicit and explicit beliefs in the effectiveness of that treatment in comparison to individuals with no experience with the treatment (Silverman, Werntz, Ko, & Teachman, *in preparation*

These studies highlight that both implicit and explicit attitudes about different types of mental health treatment are associated with treatment use. Thus, the current study will

investigate implicit and explicit beliefs in the effectiveness of medication vs. therapy, in addition to their interaction. Further, this study will be the first to investigate moderators associated with unequal access to mental health resources that may increase or decrease the association between mental health treatment effectiveness beliefs and current treatment use.

Overview of Present Study and Hypotheses

Data for the current study were collected from a large, diverse sample of visitors to the Project Implicit Health website (https://implicit.harvard.edu/implicit/user/pih/pih/index.jsp; formerly Project Implicit Mental Health) who completed the Treatment Implicit Association Test (IAT; labeled: "Do you implicitly favor medication or talk therapy?"). While this sample is not representative of the U.S. population in terms of its demographic makeup, it is large enough, and has enough variability, to examine key demographic-based differences (e.g., education level, racial-ethnic group membership). The study aims to replicate and extend previous research on mental health treatment disparities by evaluating: Aim 1) whether variables associated with unequal access to mental health resources (Black or Latinx racial-ethnic group membership, education level, and number of community-level treatment providers and facilities) are associated with self-reported current mental health treatment use among individuals with current mental health difficulties; and Aim 2) among those receiving care, how well it aligns with their implicit and explicit beliefs about the effectiveness of mental health treatment (medication versus therapy) as a proxy to examine how unequal access to mental health resources influences the likelihood of accessing preferred effective treatment.

We preregistered several hypotheses (osf.io/z28wr). First (Aim 1), among individuals with mental health difficulties, Black and Latinx individuals (versus non-Latinx White individuals), individuals with lower (versus higher) education levels, and individuals living in communities with fewer (versus greater) treatment providers and facilities will be less likely to report current use of any mental health treatment (especially when multiple barriers are present). Second, among individuals receiving mental health treatment, both explicit and implicit effectiveness beliefs will

align with individuals' concurrent use of psychiatric medication and/or therapy. Because research examining the predictive power of implicit versus explicit attitudes (Greenwald, Poehlman, Uhlmann, & Banaji, 2009; Kurdi et al., 2018), and implicit-explicit discrepancies (Shoda et al., 2014) is conflicting, we have no specific hypothesis about whether implicit or explicit beliefs will be a stronger predictor of treatment use, or about their interaction. Third (Aim 2), implicit and explicit beliefs about the effectiveness of medication versus therapy will be least likely to align with current use of medication and/or therapy for individuals who have less access to mental health resources.

This study aims to replicate the findings of disparities in rates of mental health treatment use among Black and Latinx individuals (Cook et al., 2019), individuals with lower (vs. higher) levels of education (e.g., Steele et al., 2007), and individuals living in communities with fewer mental health resources (e.g., McCarthy et al., 2007). This study extends the existing literature in a number of ways. By including multiple measures associated with unequal access to mental health resources and their interactions, we can better understand how these variables impact individuals' ability to access mental health treatment in the real-world. Further, this study investigates how different variables associated with unequal access to mental health treatment moderate the relationship between both implicit and explicit beliefs about the effectiveness of medication versus therapy and use of medication and/or therapy.

Method

Participants

Participants were a subset of 5,626 Black, Latinx, and non-Latinx White adult visitors to the Project Implicit Health (PIH) research website (https://implicit.harvard.edu/implicit/user/pih/pih/index.jsp) between September 2011 and December 2017. In comparison to the U.S. Census, the PIH sample was younger, had more females and non-Latinx White individuals, and was relatively more highly educated. Demographic characteristics are provided in Table 1. Visitors came to the site from a variety of

sources (e.g., medical provider recommendation, link at Project Implicit, google search), and were able to explore different IATs covering a range of mental health topics (e.g., depression, alcohol use, mental illness stigma, anxiety). Participants included in this study are those who consented to participate and chose to complete the Treatment IAT (labeled: "Do you implicitly favor medication or talk therapy?").

Measures

Demographics. Participants completed a brief demographic questionnaire with questions regarding race, ethnicity, sex, education, and zip code. Racial-ethnic group membership was dichotomized (Black and/or Latinx vs. non-Latinx White) in order to examine whether whiteness [as a proxy for unearned privilege in a white privileged society (i.e., Liu, 2017, Liu et al., 2019)] was associated with study outcomes of interest. However, we recognize this choice also has real drawbacks given expected heterogeneity between the Black and Latinx subgroups.

Mental Health History (See Section 1.1. of the supplement for a full description of the measure and Table 1 for clinical characteristics).

Current mental health difficulties. Participants responded to the question "Are you currently, or have you ever struggled with moderate to severe mental or emotional difficulties (e.g. depression, panic attacks, anxiety, fighting a lot with family or friends, problems in school, etc.) that lasted a minimum of several weeks and interfered with your life?" If a participant responded "*no,*" they moved on to the next task in the study. If the participant responded "*yes,*" they next answered "Is this a current difficulty?" In July 2015, part way through data collection (after 4,176 participants), the mental health history form was updated with the reworded question: "Please read the following list of disorders and indicate whether you are currently struggling or have struggled in the past with these types of mental illnesses." Participants viewed a list of mental health diagnostic categories (e.g., Anxiety Disorders, Depressive Disorders), and checked yes/no to the statement "I am currently struggling with this."

Participants who indicated either current emotional or mental health difficulties (from the mental health history questionnaire prior to July 2015), or current struggle with a mental health diagnosis (from the mental health history questionnaire after July 2015) were classified as currently experiencing mental health difficulties.

   Current Mental Health Treatment Experience. Participants read a list of possible sources of treatment, and indicated all treatments that they were currently using. "Psychologist", "school counselor", "social worker," "LMHC," and "in-person support group" were classified as *therapy*. "Psychiatrist," "prescription medication," "medical professional," and "general practitioner" were all classified as *psychiatric medication*. Participants who selected "other" were asked to describe the treatment source. Write-in responses were independently coded as *therapy, prescription medication,* or *neither* by two clinical psychology doctoral students and one undergraduate research assistant. A third clinical psychology doctoral student then made decisions about discrepant codes. Participants who indicated currently using any of the therapy or psychiatric medication sources were classified as currently accessing mental health treatment.

   Implicit Mental Health Treatment Beliefs. The Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) is a reaction time task that measures time taken to classify stimuli into superordinate categories to measure the relative association strengths between constructs. Four categories were used: *medication* (medication, drugs, pills, prescription), *therapy* (therapy, counseling, talking, psychotherapy), *unhelpful* (unhelpful, useless, ineffective, futile) and *effective* (effective, beneficial, advantageous, helpful). Seven blocks were presented consisting of three practice and four critical blocks. Two practice blocks consisted of 20 practice trials each in which only two categories from a single dimension (e.g., *medication* and *therapy*) appeared on the screen. Participants next completed blocks 3 (20 trials) and 4 (40 trials) that were identical, and involved one of the combined category pairing classification conditions (e.g., *medication* paired with *effective* and *therapy* paired with *unhelpful*). Block 5 was another practice block of 40 trials in which *medication* and *therapy* were

the only headings remaining on the screen, however they switched sides of the screen. Finally,

blocks 6 and 7 followed the same format as blocks 3 and 4, but the category pairings were

reversed (e.g., *medication* was now paired with *unhelpful* and *therapy* was paired with *helpful*).

The order of the critical category pairing conditions was randomized. Positive scores reflect

stronger *therapy+effective* and *medication+unhelpful* associations, while negative scores reflect

stronger *medication+effective* and *therapy+unhelpful* associations. Internal consistency was

examined by calculating the correlation between a D score using data from blocks 3 and 6 and

a D score using data from blocks 4 and 7, following Greenwald, Nosek, & Banji (2003); $r = .74$,

$p < .001$.

Explicit mental health treatment beliefs. To have an explicit evaluation that is similar

to the IAT's relative structure, participants completed two questions (i.e., semantic differential

items; Greenwald et al., 1998; Ranganath & Nosek, 2008). Participants answered "To what

extent do you think of therapy as effective or unhelpful?" – with "psychiatric medication"

replacing "therapy" in the second question – on a scale from 1 (*extremely effective*) to 9

(*extremely unhelpful*). To mirror the IAT's relative structure, the medication response was

subtracted from the therapy response, with greater scores reflecting greater *therapy+effective*

and *medication+unhelpful* explicit associations.

Treatment providers and facilities. Data were obtained from the Area Health

Resource File (AHRF; Bureau of Health Professions, 2019), a national publicly available dataset

that includes information on health care professionals, health care facilities, and population

characteristics at the county, state, and national levels (https://data.hrsa.gov/topics/health-

workforce/ahrf). The following AHRF variables provided information on the number of treatment

providers and facilities in each U.S. county: non-federal child psychiatrists, non-federal

psychiatrists, federal psychiatrists, non-federal primary care physicians, non-federal general

practitioners, short-term psychiatric hospitals (child and adult), long-term psychiatric hospitals

(child and adult), short-term general hospitals with psychiatric treatment (child and adult), short-

term general hospitals with drug and alcohol treatment, short-term general hospitals with primary care, short-term general hospitals with psychiatric outpatient services, and community mental health centers. Data on the number of psychologists and social workers could not be obtained from the AHRF for 2011-2017. Each variable was then divided by the county-level population estimate and multiplied by 10,000 to provide an estimate of the number of different types of mental health service providers and facilities per 10,000 residents.

Procedure. After selecting the Treatment IAT study from the list of PIH studies, visitors completed the informed consent, which included information about the upcoming tasks. Following consent, the IAT, explicit mental health beliefs questions, demographic questions, and mental health history questions were administered in random order. Participants were then fully debriefed, and given the opportunity to view their IAT score and feedback if they desired.

Data Analytic Plan. The IAT was scored following current scoring recommendations (Greenwald et al., 2003) to produce a D score (conceptually similar to Cohen's d effect size) that represents the difference between latencies between blocks in critical pairing conditions, divided by the standard deviations across all of the blocks. Based on these scoring recommendations, IAT data were excluded if fewer than 119 trials were completed, response latencies were greater than 10,000 ms, or if 10% or more of trial reaction times were faster than 300 ms, resulting in the exclusion of 2.1 % of the IAT data (117 participants' IAT data). Extreme outliers in the IAT D score and explicit belief variables were identified using median absolute deviation (MAD; see Leys, Ley, Klein, Bernard, & Licata, 2013). As opposed to using standard deviations, MAD is a more robust method of detecting dispersion, which is less influenced by outliers. Following Leys et al. (2013), cases with a MAD of 2.5 or more were removed from the samples, resulting in the removal of 208 (3.7%) explicit belief scores, and 12 (<.01%) IAT D scores. We did not test assumptions of linearity, normality, or homoscedasticity for any of our variables because logistic regression models do not require any of these assumptions to be met (Pampel, 2000).

Within the dataset of 5,626 participants, to decrease the number of tests, principal component analysis (PCA) was used to reduce the 11 AHRF variables into one treatment facilities cluster and one treatment providers cluster, following Tabachnick and Fidell (2019; see Section 1.2 of the supplement for principal component loadings). Principal component scores were then used in analyses to measure the number of treatment providers and facilities in each participant's county. Principal component scores were selected over factor scores because PCA provides more accurate scores (Browne & Tateneni, 2010), and because the residuals are allowed to correlate with one another (Tabachnick & Fidell, 2019).

We then conducted analyses in MPlus Version 8.4 (Muthén & Muthén, 1998-2009) to test each of our research questions. For our first aim, among the subset of 4,827 individuals who indicated current mental health difficulties, we used a multiple logistic regression model to examine whether the four-way interaction between racial-ethnic group membership, education level, number of treatment providers, and number of treatment facilities predicts concurrent engagement in any form of mental health treatment (yes/no). Next, to examine our second aim among the subset of 3,643 individuals currently using any form of mental health treatment, we tested eight three-way interaction models with implicit and explicit beliefs about the effectiveness of medication versus therapy entered simultaneously with one of the four moderator variables (education level, racial-ethnic group membership, number of treatment providers, number of treatment facilities). Current psychiatric medication use (yes/no) and current therapy use (yes/no) were entered in separate models as outcome variables. Alpha was set at .05 for all two-tailed significance tests. Following procedures outlined by Maxwell and Delaney (2003), significant interactions were broken down to test simple effects using a Bonferroni correction for post-hoc multiple comparisons. If three-way (AxBxC) interaction effects were not significant, we then tested all two-way interactions (AxB, AxC, and BxC). If neither the two-way nor three-way interactions effects were significant for a given model, we tested the main effects for all three variables in the model (main effects for A, B, and C).

Individuals currently using *both* medication and therapy (*n* = 2,399) were included in models for both dependent variables. These individuals were considered to be accessing their preferred effective treatment because they were clearly getting their favorite of the two, even if they were also accessing other treatment options. Missing data for individuals' education level (*n* = 27), IAT D scores (*n* = 500), and explicit beliefs (*n* = 255) were handled using Full Information Maximum Likelihood. Because the study involved the subset of individuals who identified as non-Latinx White, Black, or Latinx, individuals with missing race-ethnicity data (*n* = 28) were removed from the dataset. Individuals who endorsed being Black and/or Latinx *and* any other race (e.g., White, Asian, Native Hawaiian/Pacific Islander, American Indian/Alaskan Native; *n* = 451) were included in the Black/Latinx group. Individuals who endorsed being non-Latinx White and any other race besides Black (e.g., Asian, Native Hawaiian/Pacific Islander, American Indian/Alaskan Native, Other race; *n* = 208) were excluded from analyses.

Results

Aim 1: Differences in Current Mental Health Treatment Use

Across the sample of participants who indicated current mental health difficulties (*n* = 4,827), in line with hypotheses, higher education level was associated with self-reported higher probability of current use of mental health treatment (β = 0.33, 95% CI [0.24, 0.42], *p* < .001, OR = 1.39). Contrary to hypotheses, racial-ethnic group membership, number of mental health treatment providers, number of treatment facilities, and the two, three, and four-way interactions between the predictors were not associated with current mental health treatment use (see Table 2).

Aim 2. Moderators of Effectiveness Beliefs and Medication/Therapy Use

Explicit and Implicit Beliefs. As hypothesized, stronger implicit and explicit beliefs in the effectiveness of therapy (vs. medication) were associated with greater therapy use, while stronger implicit and explicit beliefs in the effectiveness of medication (vs. therapy) were associated with greater medication use in all models except in the two moderation models

including Education Level as the moderator (note that these main effects were examined only in cases where there were not significant two- or three-way interactions; see Table 3). Based on visual comparison of the standardized beta parameters, implicit effectiveness beliefs (in comparison to explicit beliefs) were more strongly associated with both current therapy and medication use in all eight models (see Table 3).

Racial-Ethnic Group Membership. Racial-ethnic group membership moderated the relationship between implicit beliefs about the effectiveness of therapy vs. medication and reported therapy use (β = -1.08, 95% CI [-1.78, -0.39], p < .01, OR = 0.34). Post-hoc multiple comparisons using a Bonferroni correction with alpha set at .025 (.05/2 tests) revealed that stronger (vs. weaker) implicit beliefs in the effectiveness of therapy were associated with greater therapy use for non-Latinx White individuals (β = 0.92, 95% CI [0.71, 1.14], p < .001, OR = 2.51), but not for Black/Latinx individuals (β = -0.04, 95% CI [-0.63, 0.54], p = .887, OR = 0.96). Among non-Latinx White individuals, there was a strengthening effect, in which as individuals' implicit beliefs in the effectiveness of therapy (vs. medication) increased, they were proportionally more likely to use therapy. However, Black and Latinx individuals were just as likely to report using therapy, regardless of their implicit effectiveness beliefs (see Figure 1). These results suggest that, as hypothesized, implicit beliefs in the effectiveness of therapy vs. medication were less likely to align with current use of therapy for Black and Latinx individuals in comparison to non-Latinx White individuals.

Racial-ethnic group membership did not moderate the relationship between explicit beliefs in the effectiveness of therapy vs. medication and reported therapy use. Also, racial-ethnic group membership did not moderate the relationship between either implicit or explicit beliefs in the effectiveness of therapy vs. medication and reported medication use. However, the main effect of racial-ethnic group membership was associated with current medication use, such that non-Latinx White individuals (vs. Black and Latinx individuals) had a greater likelihood of endorsing proportionally more current medication use (82.3% vs. 71.2%; see Table 3).

Education Level. Contrary to hypotheses for Aim 2, education level did not moderate the relationship between either implicit or explicit beliefs in the effectiveness of therapy vs. medication and either current therapy or medication use. Also, the main effect of education level was not associated with current use of therapy or medication when tested in the context of the moderation models (see Table 3).

Number of community-level treatment providers. Number of community-level treatment providers did not moderate the relationship between implicit or explicit beliefs in the effectiveness of therapy vs. medication and current therapy use. However, the main effect of community level treatment providers was associated with current therapy use in the expected direction, such that individuals living in communities with greater (vs. fewer) mental health treatment providers had a greater likelihood of endorsing current use of therapy ($\beta = 0.17$, 95% CI [0.06, 0.29], $p < .01$, OR = 1.19).

Results revealed a significant three-way interaction effect of explicit beliefs and implicit beliefs in the effectiveness of therapy vs. medication, and number of community-level treatment providers on reported current medication use ($\beta = -0.22$, 95% CI: [-0.37, -0.06], $p < .01$, OR = 0.81). Following methods outlined by Dawson and Richter (2004), we examined the effect of the simple slopes of one predictor variable (explicit beliefs in the effectiveness of therapy vs. medication) on the outcome variable (current medication use) when the two other predictors (implicit beliefs in the effectiveness of therapy vs. medication, and number of community-level treatment providers) were held constant at different combinations of high and low values (-1.0 and +1.0 standard deviations from the mean; see Section 2.1 of the supplement). We then tested the differences between the four simple slopes using a Bonferroni correction for multiple post-hoc comparisons, with alpha set at .008 (.05/6 tests). Results of slope difference tests revealed that none of the slopes were significantly different from one another at the .008 alpha level cut-off (see Table 4).

The three-way interaction was then graphically displayed to help visualize the data (see Figure 2). In the first graph, Slope 4 appears most different from Slopes 1, 2, and 3. The visual depiction of Slope 4 suggests that when implicit beliefs in the effectiveness of therapy vs. medication were stronger (vs. weaker), and the individual lived in a community with *more* (vs. fewer) treatment providers, there appeared to be a strengthening effect, such that as individuals' explicit beliefs in the effectiveness of medication (vs. therapy) increased, individuals had a *greater probability* of endorsing medication use. In the second graph, Slope 5 appears to be most different from Slopes 6, 7, and 8. The visual depiction of Slope 5 suggests that when explicit beliefs in the effectiveness of therapy vs. medication were weaker (vs. stronger) and the individual lived in a community with *fewer* (vs. more) treatment providers, there appeared to be an attenuating effect, such that as implicit beliefs in the effectiveness of therapy (vs. medication) increased, individuals had a *lower* probability of endorsing medication use. Taken together, the figure suggests that when individuals held stronger implicit beliefs in the effectiveness of therapy (vs. medication), but stronger explicit beliefs in the effectiveness of medication (vs. therapy), they appeared to have a greater probability of endorsing current medication use when they lived in a community with more (vs. fewer) treatment providers. (Note, the interpretation of the graphs aligns with the pattern seen in the slope difference tests in Table 4, though significance was not achieved at the corrected alpha level for the slope difference tests.)

Number of community-level facilities. Contrary to hypotheses, number of community-level mental health treatment facilities did not moderate the relationship between either implicit or explicit beliefs in the effectiveness of therapy vs. medication and either current therapy or medication use, nor was the main effect of number of treatment facilities associated with current use of therapy or medication (see Table 3).

Discussion

The present study examined whether four variables associated with unequal access to mental health resources (racial-ethnic group membership, education level, number of

community-level treatment providers, and number of community-level treatment facilities) predicted concurrent engagement in mental health treatment, finding that higher education level was associated with current use of treatment (either medication or therapy). Further, this was the first study to examine whether these variables moderated the relationship between preferred effective mental health treatment (operationalized as implicit and explicit beliefs in the effectiveness of therapy versus medication) and current use of medication and/or therapy. Interaction effects were not consistent across all moderation models tested. However, partially in line with hypotheses, Black or Latinx racial-ethnic group membership and living in a community with fewer community-level treatment providers were sometimes associated with a lower probability of accessing preferred effective mental health treatment, though results varied across implicit and explicit belief measures.

Current Mental Health Treatment Use

To replicate and extend research on mental health treatment use disparities, we tested the relationship between four variables associated with unequal access to mental health resources and their interactions, and self-reported concurrent mental health treatment use. Education level was associated with current mental health treatment use, which aligns with research finding that individuals with more education are more likely to receive mental health services than individuals with less education (Steele et al., 2007). While the present study does not enable us to investigate possible mechanisms for this finding, one explanation is that higher education is associated with greater access to high-paying jobs and earnings, and better healthcare and health insurance coverage (Ross & Mirowsky, 2010), which may allow for increased access to mental health treatment. Individuals with lower levels of education may also be less likely to seek out mental health treatment because they lack mental health literacy or insight into their symptoms (Yen et al., 2005). Further research on mechanisms through which education increases the likelihood of accessing mental health treatment may shed light on ways to increase access to effective treatments among less educated individuals.

Contrary to hypotheses and prior research, none of the other variables associated with access to mental health resources, nor any of the interaction terms, were significant predictors of current mental health treatment use. There are several possible explanations for these results. First, the outcome variable (current mental health treatment use) and two of the predictor variables (number of treatment providers and facilities), were not congruent at the measurement level (i.e., individual- vs. community-level and self-reported vs. national database), which may have led to a lack of shared variance between them.

Second, given that many factors are associated with educational attainment, including one's racial-ethnic group membership (U.S. Census Bureau, 2019), we wondered if there was a high level of overlap between education level and racial-ethnic group membership in the model. However, post-hoc analyses demonstrated that only 0.81% of the variance between racial-ethnic group membership and education level was shared ($\chi2(3, 4,812) = 39.55$, $p < .001$, Cramer's V = .09; see Section 2.2 of the supplement for observed frequencies in each category). As such, overlapping variance among the two self-reported predictors likely does not explain the null relationship between racial-ethnic group membership and current treatment use.

Third, research highlighting racial disparities in mental health treatment use (e.g., Cook et al., 2016; U.S. Department of Health and Human Services, 2013) has generally been conducted in national population-based samples, which differ from our sample in a number of ways. In our sample, only 3.0% of Black and Latinx individuals had less than a high school degree, whereas in other studies, 14.6 - 52.0% of Black and Latinx individuals had less than a high school degree (Cook et al., 2013, 2016). This group, which may be particularly vulnerable to structural racism and classism, was not adequately represented in our data, which may help explain why our results differ from previous findings. Moreover, Black and Latinx participants in this study (compared to other studies) may be more invested in mental health treatment and research, as evidenced by their visiting the PIH website and choosing to complete the Treatment IAT, and thus may be more motivated to seek out mental health treatment, or to

attempt to overcome barriers to treatment. They may also experience less internalized stigma of mental illness, which can be a deterrent from help-seeking (Clement et al., 2015). Investment in mental health treatment may serve as a protective factor for Black and Latinx individuals (*if* other structural barriers can be overcome), raising intriguing possibilities for future research into methods of increasing investment as a means of reducing treatment use disparities among this group.

Implicit and Explicit Beliefs about Therapy and Medication Effectiveness

Prior research has found that implicit and explicit mental health treatment attitudes predict treatment behaviors (medication adherence, Rusch et al., 2009; medication and therapy use, Silverman et al., *in preparation*). Consistent with these findings, in models where main effects were examined (i.e., models with no significant interaction effects), implicit and explicit beliefs in the effectiveness of therapy vs. medication aligned with current medication and/or therapy use in all models except the two models testing education level as a moderator. Further, implicit (in comparison to explicit) effectiveness beliefs were more strongly associated with current therapy and medication use, based on visual comparison of the standardized beta parameters, in all eight models. These results align with Kurdi and colleagues' (2018) meta-analysis finding that implicit (in comparison to explicit) measures are a stronger predictor of behavior, pointing to the value of including implicit measures in future research on mental health treatment attitudes.

Moderators of Effectiveness Beliefs and Treatment Use

Racial-ethnic group membership and number of community-level treatment providers were associated with current medication and/or therapy use in complex ways. Specifically, in comparison to non-Latinx White individuals, Black and Latinx individuals' implicit beliefs in the effectiveness of therapy vs. medication were less likely to be associated with their therapy use, and they were overall less likely to use medication. Individuals living in communities with fewer (vs. more) treatment providers were less likely to access therapy in general, and less likely to

access medication when they explicitly believed that medication was more effective than therapy, but implicitly believed that therapy was more effective than medication.

      Racial-Ethnic Group Membership. First, Black and Latinx individuals were proportionally less likely to endorse current medication use in comparison to non-Latinx White individuals. This finding is consistent with previous research documenting racial disparities in mental health treatment use (Cook et al., 2019), which may result from structural determinants (e.g., Chow et al., 2003; Dinwiddie et al., 2013), and interpersonal factors (e.g., mental health stigma, Clement et al., 2015). Second, in line with hypotheses, implicit beliefs in the effectiveness of therapy vs. medication were less likely to align with current therapy use among Black and Latinx individuals in comparison to non-Latinx White individuals. Among Black and Latinx individuals, there was no effect of implicit effectiveness beliefs on current therapy use; whereas, among non-Latinx White individuals, as implicit beliefs in the effectiveness of therapy (vs. medication) increased, they were more likely to endorse current therapy use. While intriguing, this result should be interpreted with caution because the interaction effect was exploratory in nature, and was not consistent across both outcome variables.

      One explanation for the observed interaction effect is that Black and Latinx individuals encounter numerous structural inequities, including residential segregation (e.g., Dinwiddie et al., 2013) and a lower likelihood of having private health insurance (Chow et al., 2003), which restrict the range of mental health services they can access. As such, Black and Latinx individuals are more likely to receive mental health services from hospital emergency rooms and non-specialist treatment providers (Chow et al., 2003; Alegría et al, 2002), where medication is offered more frequently than therapy (e.g., Kroenke & Unutzer, 2017), regardless of their implicit effectiveness beliefs. Thus, the observed interaction may be associated with therapy, but not medication, use because these structural barriers make it especially hard for Black and Latinx individuals to access therapy.

A second explanation for this interaction effect is that, due to unequal access to mental health resources, Black and Latinx individuals may be less likely to be exposed to cues related to mental health treatment (i.e., they are less likely to use treatment, may be less familiar with treatment options, and may know fewer people who have treatment experience). As such, they may have fewer opportunities to develop, elaborate, and practice implicit beliefs about the effectiveness of therapy vs. medication, making these implicit beliefs weaker and less predictive.

Number of Community-Level Treatment Providers. In line with hypotheses, living in a community with more treatment providers was associated with a greater likelihood of endorsing current therapy use. This result aligns with research finding that greater availability of treatment providers is positively associated with mental health service use (McCarthy et al., 2007; Wei et al., 2005). Notwithstanding, this result should be interpreted carefully given number of treatment providers only predicted treatment use in the therapy-specific Aim 2 model, not in the Aim 1 model predicting use of any type of treatment.

Results also revealed a positive three-way interaction effect of implicit and explicit beliefs in the effectiveness of therapy vs. medication and number of community-level treatment providers on current medication use. Specifically, when individuals held stronger implicit beliefs in the effectiveness of therapy (vs. medication), but stronger explicit beliefs in the effectiveness of medication (vs. therapy), they were more likely to report current medication use when they lived in a community with more (vs. fewer) treatment providers. Accordingly, access to community-level treatment providers may be particularly important when an individual's implicit and explicit effectiveness beliefs misalign in this way. That said, this must be followed up with future research and this interaction effect must be interpreted with caution given it was exploratory and was not consistent across both models tested.

If this result replicates, it raises interesting questions about the links between treatment effectiveness beliefs, community resources, and treatment access. On one hand, it is possible

that living in a community with more treatment providers affords flexibility to choose among different treatment options, thus increasing the likelihood of accessing preferred effective treatment. Alternatively, individuals living in communities with more treatment providers may have greater exposure to mental health treatment, and thus may possess stronger effectiveness beliefs, leading to stronger treatment use predictions. Critically, this study does not allow for causal inferences and we must avoid inferring relationships at the individual-level based on group aggregates (i.e., the ecological fallacy) because number of community-level treatment providers was measured at the county-level. We cannot be certain based on these data how many and what type of community-level treatment providers or facilities were available to each individual. We can speculate though that the interaction may have occurred for the medication (but not therapy) use outcome because the principal component created to indicate number of community-level treatment providers consisted of five treatment providers who are more likely to provide medication than therapy (e.g., general practitioners, psychiatrists).

Number of Community-Level Treatment Facilities and Education Level. Contrary to hypotheses, neither the interaction effects nor main effects for number of community-level treatment facilities and education level were significantly associated with medication or therapy use when tested in the context of moderation. This may partly be due to measurement issues. The principal component measuring number of community-level treatment facilities only explained 38% of the variance among the six treatment facilities variables. Thus, this variable may not have captured enough variance in the data to reveal significant effects. Future research may want to test effects for different types of mental health treatment facilities (e.g., hospitals, community-mental health centers) separately rather than combining them into a principal component.

For the moderation models testing education level, the null results contrast with findings from Aim 1, which demonstrated an association between education level and overall mental health treatment use. Importantly, the moderation models were tested among the subset of

individuals currently receiving some form of mental health treatment. Thus, education level may play a larger role in whether or not one accesses some form of mental health treatment, but not in which type, or whether that treatment aligns with their effectiveness beliefs. Further work examining potential mechanisms linking different resources to various treatment use outcomes may help illuminate this disparate pattern of results.

Limitations

This study has several methodological limitations. As with any cross-sectional study, causal inferences are not possible. Additionally, the AHRF dataset did not include certain community-level provider or facility variables (e.g., number of psychologists, social workers, private practice offices, or school counseling centers) that are more likely to offer therapy over medication, possibly biasing the variable to better predict medication use. Also, the study lacked a direct measure of self-reported *preference* for medication vs. therapy, and lacked assessment of other components of preference beyond perceived effectiveness. Relatedly, the principal component used to measure number of community-level treatment facilities only explained 38% of the variance in the data.

Another measurement issue concerns the structure of the variables. Measures of implicit and explicit effectiveness beliefs were relative (beliefs about medication effectiveness relative to beliefs about therapy effectiveness), while the dependent variables used in the moderation analyses were absolute, creating a mismatch that may limit their relationships. Additionally, while there is considerable value in including measures of treatment attitudes that do not require conscious control, it will be important for future research to examine whether other implicit measures, such as the evaluative priming technique (Fazio, Sanbonmatsu, Powell, & Kardes, 1986), lead to results similar to those found in this study.

Moreover, racial-ethnic group membership was dichotomized (Black and/or Latinx vs. non-Latinx White) in order to examine whether whiteness (as a proxy for living in a racist society) was associated with outcomes of interest. Thus, our results are limited by the fact that

we are not able to account for important differences between these distinct racial-ethnic groups. Finally, when the measure of current mental health difficulties was modified in 2015 (from assessing general mental or emotional difficulties to assessing specific psychiatric diagnoses), the new measure allowed for more precision, but may have excluded individuals who have mental health difficulties, but have not had access to mental health services and are less knowledgeable about mental illness so do not self-identify as having a psychiatric diagnosis.

Conclusion

Findings from this study suggest that Black or Latinx individuals' implicit effectiveness beliefs were less likely to align with their therapy use, and that they were overall less likely to use medication in comparison to non-Latinx white individuals. Further, individuals living in communities with fewer treatment providers were less likely to access therapy in general, and were less likely to access medication when they lived in a county with fewer treatment providers and explicitly believed that medication was more effective, but implicitly believed that therapy was more effective. Models in the present study included four variables associated with unequal access to mental health resources that are driven in part by structural racism and classism. As such, future work should capture information on the actual mechanisms contributing to racial/ethnic and class inequities in access to preferred effective mental health services (e.g., income inequality, residential segregation). This work may ultimately help to identify policy reforms and points of intervention to increase access to preferred effective treatments among individuals who are disproportionately less likely to access them.

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Table 1.
Demographic Characteristics and Mental Health History

Characteristic	(N = 5,626)
Age (years): *M* (*SD*)	29.53 (11.91)
Gender: *n* (%)	
Female	4,439 (78.9)
Male	1,155 (20.5)
Unknown or Prefer not to Answer	32 (0.6)
Race-Ethnicity: *n* (%)	
Non-Latinx White	4,674 (83.1)
Black only	397 (7.1)
Latinx only	528 (9.4)
Black and Latinx	27 (0.5)
Education Level: *n* (%)	
High School Graduate or Less	184 (3.3)
Some College	3,164 (56.2)
Associates or Bachelor's Degree	1,416 (25.2)
Some Graduate School or Advanced Degree	847 (15.1)
Unknown or Prefer not to Answer	15 (0.3)
Clinical Characteristics (self-reported)*: n* (%)[a]	
Currently experiencing a mental health/emotional difficulty	4,827 (85.8)
Currently using some form of mental health treatment	3,643 (64.8)
Currently using medication	2,943 (52.3)
Currently using therapy	3,099 (55.1)
Currently using both medication and therapy	2,399 (42.6)

Note. [a]Percentages total over 100.0, because participants were able to endorse multiple response options on the mental health history form*.*

Table 2.

Aim 1. Association between Predictor Variables and Current Mental Health Treatment Use

Variable Name	β (SE)	95% C.I.	OR
EDU*RACE*PROV*FAC	-0.32 (0.22)	[-0.76, 0.11]	0.72
EDU*RACE*PROV	-0.18 (0.13)	[-0.44, 0.09]	0.84
EDU*RACE*FAC	-0.16 (0.22)	[-0.59, 0.27]	0.86
EDU*PROV*FAC	-0.03 (0.04)	[-0.11, 0.05]	0.97
RACE*PROV*FAC	0.70 (0.49)	[-0.26, 1.66]	2.02
EDU*RACE	-0.08 (0.12)	[-0.31, 0.16]	0.93
EDU*PROV	0.00 (0.05)	[-0.01, 0.10]	1.00
EDU*FAC	0.08 (0.05)	[-0.02, 0.18]	1.08
RACE*PROV	0.26 (0.33)	[-0.39, 0.90]	1.29
RACE*FAC	0.45 (0.48)	[-0.49, 1.39]	1.57
PROV*FAC	0.00 (0.12)	[-0.21, 0.21]	1.00
EDU	***0.33 (0.05)**	**[0.24, 0.42]**	**1.39**
RACE	-0.43 (0.29)	[-0.99, 0.14]	0.65
PROV	0.17 (0.13)	[-0.09, 0.42]	1.18
FAC	-0.20 (0.12)	[-0.44, 0.05]	0.82

Note. SE = Standard Error; 95% CI = 95% Confidence Interval; OR = Odds Ratio;
EDU = Education level; RACE = Racial-ethnic group membership; PROV = Number of
community-level treatment providers; FAC = Number of community-level treatment facilities.

*p < .001.

Table 3.

Aim 2. Association between Implicit and Explicit Effectiveness Beliefs, Moderator Variables, and Therapy/Medication Use

Moderator	Dependent Variable	Predictor	β (SE)	95% CI	OR
Education Level	Medication Use	Education Level	0.08 (0.08)	[-0.08, 0.24]	1.09
		Implicit Beliefs	-0.71 (0.38)	[-1.46, -0.03]	0.49
		Explicit Beliefs	-0.06 (0.19)	[-0.43, 0.31]	0.94
		Explicit*Implicit	-0.09 (0.29)	[-0.65, 0.48]	0.92
		Education Level*Explicit	-0.13 (0.08)	[-0.27, 0.02]	0.88
		Education Level*Implicit	0.03 (0.14)	[-0.25, 0.31]	1.03
		Implicit*Explicit*Education Level	0.06 (0.12)	[-0.17, 0.29]	1.06
	Therapy Use	Education Level	0.05 (0.07)	[-0.09, 0.19]	1.05
		Implicit Beliefs	*****1.35 (0.38)**	**[0.60, 2.09]**	**3.85**
		Explicit Beliefs	0.06 (0.15)	[-0.24, 0.36]	1.06
		Explicit*Implicit	0.13 (0.28)	[-0.42, 0.68]	1.14
		Education Level*Explicit	0.05 (0.06)	[-0.07, 0.16]	1.05
		Education Level*Implicit	-0.28 (0.14)	[-0.55, 0.00]	0.76
		Implicit*Explicit*Education Level	-0.01 (0.12)	[-0.22, 0.19]	0.99
Race/ Ethnicity	Medication Use	**Racial-Ethnic Group Membership**	*****-0.61 (0.16)**	**[-0.93, -0.30]**	**0.54**
		Implicit Beliefs	*****-0.63 (0.12)**	**[-0.87, -0.39]**	**0.53**
		Explicit Beliefs	*****-0.36 (0.06)**	**[-0.49, -0.24]**	**0.70**
		Explicit*Implicit	0.02 (0.10)	[-0.16, 0.21]	1.02
		Race/Ethnicity*Explicit	0.03 (0.12)	[-0.21, 0.27]	1.03
		Race/Ethnicity*Implicit	0.03 (0.29)	[-0.54, 0.60]	1.03
		Implicit*Explicit*Race/Ethnicity	0.07 (0.19)	[-0.29, 0.44]	1.08
	Therapy Use	**Explicit Beliefs**	****0.16 (0.05)**	**[0.06, 0.25]**	**1.17**
		Explicit*Implicit	0.10 (0.09)	[-0.08, 0.28]	1.10
		Race/Ethnicity*Explicit	0.12 (0.15)	[-0.17, 0.40]	1.13
		Race/Ethnicity*Implicit [a]	****-1.08 (0.35)**	**[-1.78, -0.39]**	**0.34**
		Implicit*Explicit*Race/Ethnicity	0.03 (0.25)	[-0.46, 0.52]	1.03

# Providers	Medication Use	**Implicit*Explicit*Providers** [a]	****-0.22 (0.08)**	**[-0.37, -0.06]**	**0.81**
	Therapy Use	**# Treatment Providers**	****0.17 (0.06)**	**[0.06, 0.29]**	**1.19**
		Implicit Beliefs	*****0.64 (0.11)**	**[0.42, 0.86]**	**1.90**
		Explicit Beliefs	*****0.16 (0.05)**	**[0.07, 0.25]**	**1.18**
		Explicit*Implicit	0.12 (0.09)	[-0.06, 0.27]	1.11
		Providers*Explicit	-0.03 (0.05)	[-0.13, 0.07]	0.97
		Providers*Implicit	0.00 (0.12)	[-0.23, 0.23]	1.00
		Implicit*Explicit*Providers	-0.03 (0.09)	[-0.21, 0.15]	0.97
# Facilities	Medication Use	# Treatment Facilities	-0.07 (0.05)	[-0.17, 0.04]	0.94
		Implicit Beliefs	*****-0.62 (0.11)**	**[-0.84, -0.40]**	**0.54**
		Explicit Beliefs	*****-0.37 (0.05)**	**[-0.47, -0.26]**	**0.69**
		Explicit*Implicit	0.04 (0.08)	[-0.13, 0.20]	1.04
		Facilities*Explicit	0.01 (0.05)	[-0.08, 0.10]	1.01
		Facilities*Implicit	0.07 (0.10)	[-0.12, 0.27]	1.08
		Implicit*Explicit*Facilities	0.11 (0.08)	[-0.05, -0.27]	1.12
	Therapy Use	# Treatment Facilities	-0.05 (0.05)	[-0.15, 0.05]	0.96
		Implicit Beliefs	*****0.63 (0.11)**	**[0.41, 0.85]**	**1.87**
		Explicit Beliefs	*****0.18 (0.05)**	**[0.09, 0.26]**	**1.19**
		Explicit*Implicit	0.10 (0.08)	[-0.07, 0.26]	1.10
		Facilities*Explicit	-0.02 (0.04)	[-0.12, 0.06]	0.98
		Facilities*Implicit	0.10 (0.10)	[-0.09, 0.29]	1.12
		Implicit*Explicit*Facilities	0.06 (0.09)	[-0.12, 0.25]	1.07

Note. [a] Following Maxwell and Delancey (2003), main effects for individual variables were not examined in models with significant interaction effects.

*p < .05; ** p <.01; ***p < .001.

Table 4.
Simple Slope Differences

Slopes	Slope difference	t-value	p-value	95% CI
1 and 2	0.09	0.64	0.52	[-0.18, 0.35]
1 and 3	0.21	1.78	0.08	[-0.02, 0.43]
1 and 4	-0.07	-0.57	0.57	[-0.31, 0.17]
2 and 3	0.12	0.97	0.33	[-0.12, 0.36]
2 and 4	-0.16	-1.33	0.18	[-0.39, 0.07]
3 and 4	-0.27	-2.43	0.02	[-0.50, -0.05]

Note. To correct for multiple post-hoc comparisons, alpha was set at .008.
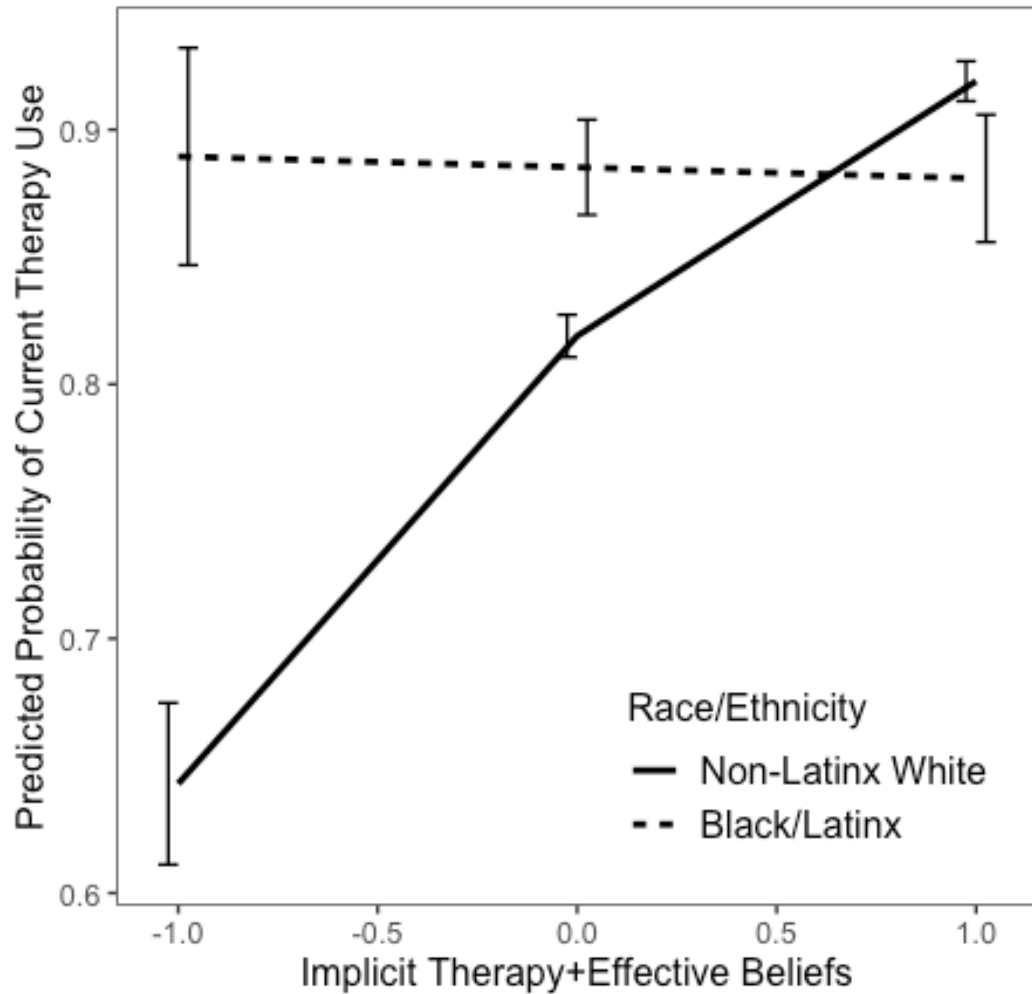Slope 1 = Weaker implicit beliefs in the effectiveness of therapy vs. medication (-1 SD), fewer treatment providers (-1 SD).
Slope 2 = Weaker implicit beliefs in the effectiveness of therapy vs. medication (-1 SD), more treatment providers (+1 SD).
Slope 3 = Stronger implicit beliefs in the effectiveness of therapy vs. medication (+1 SD), fewer treatment providers (-1 SD).
Slope 4 =Stronger implicit beliefs in the effectiveness of therapy vs. medication (+1 SD), more treatment providers (+1 SD).

Figure 1.

Racial-Ethnic Group Membership Moderates the Relationship between Implicit Beliefs in the Effectiveness of Therapy vs. Medication and Current Therapy Use

Note. The two-way interaction between racial-ethnic group membership and implicit effectiveness beliefs was tested within the subgroup of individuals currently receiving some form of mental health treatment. Thus, predicted probabilities of therapy use are higher in this subgroup in comparison to the entire sample.

Figure 2.
Three-way Interaction between Implicit and Explicit Beliefs about the Effectiveness of Medication vs. Therapy and Number of Community-Level Treatment Providers
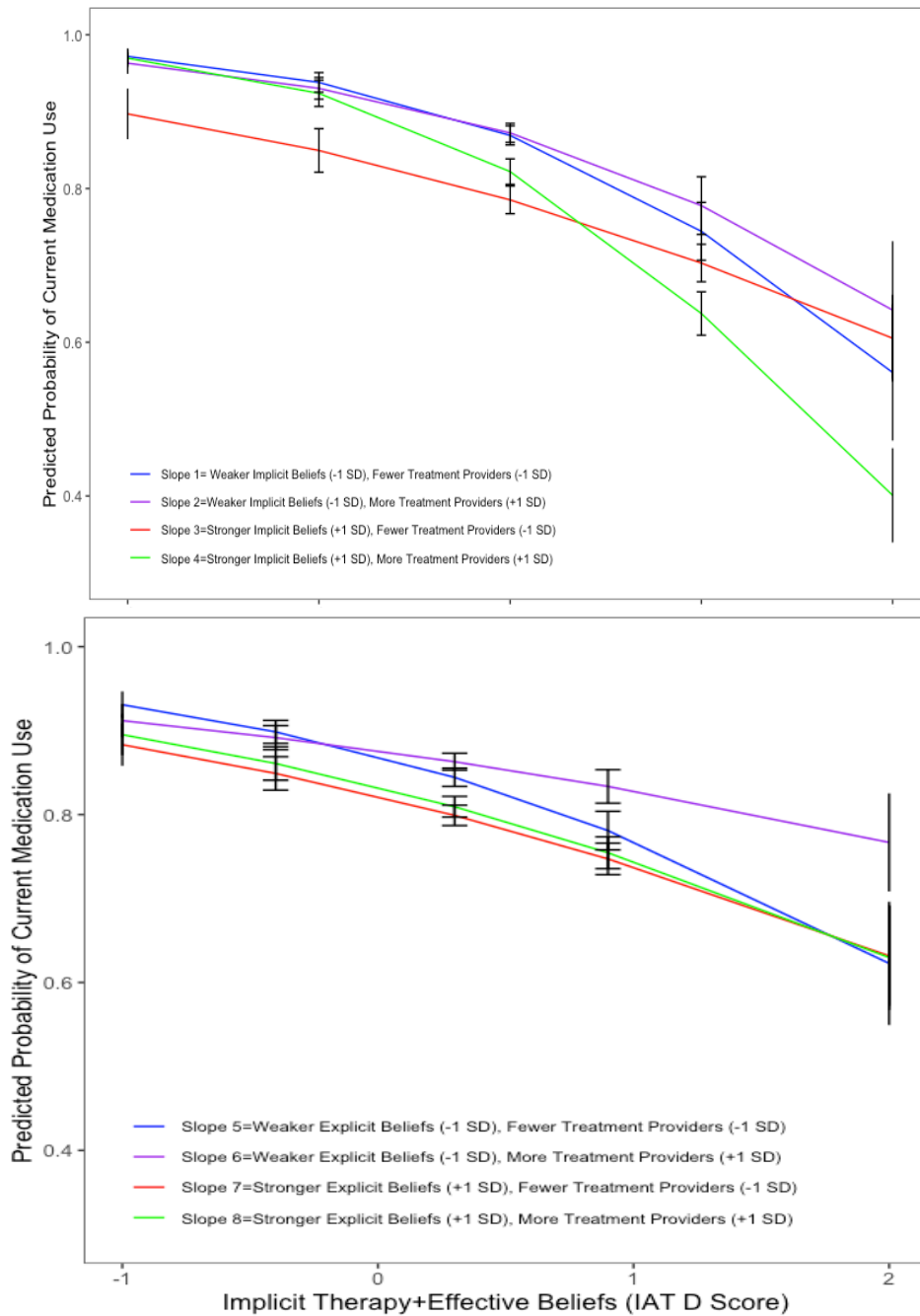
Note. Both graphs depict the same three-way interaction, with *explicit* beliefs in the effectiveness of therapy vs. medication placed on the x-axis in the first graph, and *implicit* beliefs in the effectiveness of therapy vs. medication placed on the x-axis in the second graph.

Supplemental Materials
Section S1: Method Notes

1.1 Mental Health History Form

Two different versions of the mental health history form were used throughout data collection for this study. The first version was used from September 2011 through July 14th, 2015. The second version was implemented on July 15th, 2015.

Version 1:
1. Are you currently, or have you ever struggled with moderate to severe mental or emotional difficulties (e.g. depression, panic attacks, anxiety, fighting a lot with family or friends, problems in school, etc.) that lasted a minimum of several weeks and interfered with your daily life?

1 (Yes)	0 (No)

If the person selects, yes:

2. Is this a current difficulty?

1 (Past)	2 (Current)

3. Have you ever gotten help for mental or emotion difficulties from any of the following? Please select all that apply, or select "None of the above".

1, Psychiatrist
2, Psychologist
3, School counselor
4, General practitioner
5, Teacher
6, Family member
7, Friend
8, Religious Leader
9, Coach
10, Self-help book
11, Prescription medication
12, Other
13, None of the above

Version 2:
1. We are interested in your current and past mental health difficulties. Please read the following list of disorders and indicate whether you are currently struggling or have struggled in the past with these types of disorders.

If you have struggled with the difficulty in the past and are currently suffering with it (e.g., you had depression in the past, it went away, and now you're struggling with it again), please mark both "currently struggling" and "struggled in the past". If you have been struggling continuously with the difficulty for an extended period of time (e.g., you have been depressed for 10 years), please mark only "currently struggling".

If you have never struggled with any of the disorders below, please leave this form blank and click "Continue".

1, Anxiety disorders (e.g., panic disorder, specific phobia/fear, social anxiety)
2, Depressive disorders (e.g., depression)
3, Eating disorders (e.g., anorexia, bulimia, binge-eating disorder)
4, Substance-related and addictive disorders (e.g., alcoholism/alcohol abuse, drug abuse)
5, Neurocognitive disorders (e.g., dementia, delirium, Alzheimer's, traumatic brain injury)
6, Bipolar disorders (e.g., bipolar disorder, mania)
7, Schizophrenia spectrum or other psychotic disorders (e.g., schizophrenia, psychosis)
8, Obsessive-compulsive and related disorders (e.g., obsessive-compulsive disorder, hair-pulling, body dysmorphic disorder)
9, Trauma and stress-related disorders (e.g., post-traumatic stress disorder [PTSD])
10, Sleep-wake disorders (e.g., insomnia)
11, Personality disorders (e.g., borderline, antisocial, avoidant)
12, Other mental disorders (e.g., dissociative disorders, conversion disorder, sexual dysfunction, impulse-control disorders)

2. We are also interested in your current and past **experiences with getting help** for mental or emotional difficulties (e.g., alcohol or drug problems, depression, panic attacks, anxiety, eating disorder, attention deficit, etc.) or problems in living (e.g., fighting a lot with family or friends, serious problems in school, etc.).

If you have gotten help from any of the following resources, please mark whether you have previously gotten help, are currently getting help, or mark both.

1, Psychiatrist
2, Psychologist
3, School counselor
4, Licensed mental health counselor (LMHC)
5, Social worker
6, Medical professional, not psychiatrist (e.g., family doctor, nurse, general practitioner)
7, Teacher
8, Family member, friend, or significant other
9, Religion (e.g., religious leader, church services, holy book)
10, Self-help (e.g., book, online sources)
11, Prescription medication
12, Non-prescription medications or supplements (e.g., St. John's wort)

13, 12-step program (e.g., Alcoholics Anonymous, Narcotics Anonymous)
14, In-person support group (not a 12-step program)
15, In-patient treatment center or hospitalization
16, Exercise (e.g., yoga, running)
17, Internet support resources (e.g., blogs, forums, chats)
18, Mindfulness or meditation
19, Self-medication with alcohol, marijuana, other illegal drugs
20, Pets
21, Other
22, I have not gotten help

2b. If you selected "Other", please specify:

1.2 Table of Principal Component Loadings for Number of Community-Level Treatment Providers and Facilities

Component	Area Health Resource File Variable	Loading	Uniqueness
Number of Treatment Providers	Non-Federal Primary Care Providers	0.90	0.19
	Non-Federal General Practitioners	0.49	0.76
	Non-Federal Child Psychiatrists	0.89	0.21
	Non-Federal Psychiatrists	0.89	0.20
	Federal Psychiatrists	0.61	0.62
Proportion of Variance Explained = 60%			
Number of Treatment Facilities	Short-Term General Psychiatric Hospitals	0.79	0.37
	Short-Term General Child Psychiatric Hospitals	0.71	0.49
	Short-Term General Primary Care Settings	0.49	0.76
	Short-Term General Drug/Alcohol Treatment Facilities	0.55	0.70
	Community Mental Health Centers	0.16	0.97
	Short-Term Psychiatric Outpatient Centers	0.75	0.44
Proportion of Variance Explained = 38%			

Section S2: Supplemental Results

2.1 Table of Simple Slopes for Explicit Beliefs in the Effectiveness of Therapy vs. Medication at Different Levels of Implicit Beliefs in the Effectiveness of Therapy vs. Medication and Number of Community-Level Treatment Providers

Level of Implicit Belief Variable	β (SE)	Z-value
Slope 1: Weaker implicit beliefs in the effectiveness of therapy vs. medication (-1 SD), fewer treatment providers (-1 SD)	*-0.42 (0.09)	-4.59
Slope 2: Weaker implicit beliefs in the effectiveness of therapy vs. medication (-1 SD), more treatment providers (+1 SD)	*-0.33 (0.10)	-3.46
Slope 3: Stronger implicit beliefs in the effectiveness of therapy vs. medication (+1 SD), fewer treatment providers (-1 SD)	*-0.21 (0.07)	-2.93
Slope 4: Stronger implicit beliefs in the effectiveness of therapy vs. medication (+1 SD), more treatment providers (+1 SD)	*-0.49 (0.08)	-6.14

Note. Beta Estimates are provided for the slope of explicit beliefs in the effectiveness of therapy vs. medication on the dependent variable (medication use) at +1 standard deviation and -1 standard deviation from the mean value for implicit beliefs in the effectiveness of therapy vs. medication, and number of community-level treatment providers.
*$p < .001$.

2.2 Table of Self-Reported Education Level by Racial-Ethnic Group Membership

	Non-Latinx White (n = 3,972)	Black/Latinx (n = 840)
Less than high school degree	144 (3.6%)	25 (3.0%)
High school degree, some college, Associate's degree	2252 (57.7%)	574 (68.3%)
Bachelor's degree, some graduate school	1029 (25.9%)	164 (19.5%)
Graduate degree	547 (13.8%)	77 (9.2%)