

# Depression Stigma\*

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## Abstract

People with mental illness are frequently discriminated against and stigmatized. We introduce a new measure of perceived depression stigma and examine the causal effect of perceived stigma on help-seeking in a sample of 1,844 Americans suffering from depression. We document that a large majority of our participants overestimate the extent of stigma associated with depression. An information intervention aimed at reducing perceived social stigma decreases the demand for psychotherapy. Merely prompting individuals to think about stigma has a similar effect. A mechanism experiment reveals that our interventions increase optimism about future mental health, thereby reducing the perceived need for therapy.

**Keywords:** Depression, Stigma, Information, Psychotherapy.

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# 1 Introduction

Individuals suffering from depression regularly encounter prejudice and discrimination (Ridley, 2023), exacting significant psychological tolls on those affected (Moses, 2010). The social stigma associated with depression has been hypothesized to influence whether or not people seek therapy to recover from depression (Vogel and Wade, 2009), but whether stigma, real or perceived, increases or decreases the demand for therapy is ambiguous. High stigma may impede therapy take-up by raising fears of social backlash and by increasing the reluctance to self-label as mentally ill (Corrigan and Rüsch, 2002). But by its direct adverse effect on the psychological well-being of individuals, high perceived stigma may also increase the perceived need for therapy (Andrade et al., 2014). Despite the proliferation of government and NGO information campaigns aimed at combating depression stigma,<sup>1</sup> causal evidence on the effects of information on therapy demand remains scarce. Correlational evidence is mixed, with a majority of published studies failing to find any association between perceived depression stigma and therapy demand.<sup>2</sup>

We conduct a large-scale online experiment ( $N = 1,844$ ) with US residents that suffer from depression to measure perceived depression stigma vis-à-vis its objective prevalence and to examine its causal effect on the demand for online psychotherapy, which is both effective (Andersson et al., 2019) and quickly becoming the dominant delivery mode of depression therapy (Batastini, 2021). We assess demand with an incentivized willingness to pay (WTP) for 4 weeks of online therapy. We measure perceived stigma as the estimated percentage

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<sup>1</sup>Some examples include the “Bring Change to Mind” initiative from the US or the “Bell Let’s Talk” initiative from Canada that are dedicated to encouraging dialogue about mental health.

<sup>2</sup>Out of 19 studies reviewed in Clement et al. (2015), 12 find a negative and 7 find a positive correlation. Only 3 of the negative and zero of the positive correlations achieve statistical significance.

of Americans that agreed with the view that “People with depression are lazy, hard to be around, and have weak character”. In a departure from the extant literature (Clement et al., 2015; Corrigan and Rüsch, 2002), this measure of stigma is empirically grounded and based on pilot surveys that asked depressed individuals about the kind of stigmatizing beliefs they consider most relevant and harmful.

Our participants are randomized into one of three conditions. In *Stigma info*, we elicit perceived stigma and then provide accurate information about its prevalence. Prior to receiving information, the average participant believes that 38 percent of Americans hold stigmatizing views, whereas in reality only 16 percent do. Our participants therefore exhibit the kind of pessimism that is symptomatic of depression (Beck et al., 1961), suggesting that accurate information has the potential to reduce the perceived stigma associated with depression. In the *Stigma flag* condition, we elicit perceived stigma and thereby raise the salience of stigma, but we do not provide information. In the *Pure control* condition, participants do not receive information and are not prompted to think about depression stigma in any way.

The comparison of *Stigma info* with *Pure control* captures the effect of an information intervention. Information may affect behavior by changing beliefs about or by drawing attention to the phenomenon the participant is being informed about (Conlon, 2023). The comparison of *Stigma flag* and *Pure control* then tells us how much of the average effect of *Stigma info* is driven by information merely drawing attention to stigma by raising its salience. Note that *Stigma flag* may act on attention both along the extensive margin, by alerting participants who did not previously think of stigma to the phenomenon, and the intensive margin, by prompting participants to think more concretely and deeply about the prevalence of stigma and its effects. The comparison of *Stigma info* and *Stigma flag* isolates

the *average effect* of correcting stigma beliefs on the demand for therapy, holding the salience of stigma constant. But the average effect of correcting stigma beliefs may obscure the true causal relationship between beliefs and therapy demand, because information increases the stigma beliefs of some, while decreasing them for other participants. We therefore also leverage a pre-registered comparison of *Stigma info* and *Stigma flag* in the group of participants that underestimates stigma prior to receiving information and, separately, in the group of overestimators.

We find that the willingness to pay for online therapy is significantly lower in *Stigma info* than in the *Pure control* condition (Effect= -\$9.2,  $p = 0.051$ ). Our information intervention therefore decreases the demand for therapy. Willingness to pay in *Stigma flag* is also lower than in the *Pure control* condition (Effect= - \$8.1,  $p = 0.076$ ), albeit only at marginal statistical significance, and does not differ significantly from willingness to pay in *Stigma info*. Therefore, the average effect of information on therapy demand can be almost completely accounted for by the effect of information on attention to stigma. This does not mean that the belief changes induced by information are inconsequential. Comparing *Stigma info* and *Stigma flag*, we see that information increases the demand of respondents who previously underestimated the extent of stigma by \$43.57 ( $p < 0.01$ ) and decreases the demand of treated respondents who previously overestimated the extent of stigma by \$10.38 ( $p = 0.042$ ). Put differently, lowering perceived depression stigma decreases the demand for therapy. The reason we see no average difference in therapy demand between *Stigma info* and *Stigma flag* is that the effects on over- and underestimators cancel each other out once we account for the relative size of the two groups.

Previous work has hypothesized that stigma may be a barrier to therapy demand because

the act of seeking therapy makes it known to others and salient to oneself that one is suffering from the stigmatized condition (Corrigan and Penn, 1999; Corrigan and Rüsch, 2002; Gulliver et al., 2010). Stigma acting as a barrier to demand is compatible with *Stigma flag* decreasing the demand for therapy, ostensibly by drawing attention to a negative feature of seeking therapy that some participants did not previously think of. However, stigma acting as a barrier to therapy demand also implies a negative association between stigma beliefs and therapy demand, which we rule out given the heterogeneity of treatment effects by pre-treatment stigma beliefs. Moreover, we also do not find any direct evidence for the hypothesized mechanisms by which stigma may discourage seeking therapy. In particular, *Stigma info* and *Stigma flag* have no significant effect on an index that is made up of a self-reported aversion to self-label as depressed by seeking therapy, fears of social backlash from others finding out about therapy take-up, privacy concerns and discomfort of interacting with a therapist.

So what can explain the negative effect of *Stigma info* and *Stigma flag* on therapy demand? We conduct an additional experiment with a sample of 1,008 Americans suffering from depression to investigate whether our treatments decrease participants' perceived need for therapy. Consistent with our preregistered hypotheses, *Stigma info* makes participants more optimistic about improving their future mental health absent therapy. Participants in *Stigma info* are also significantly more likely to state that they can rely on friends and family to improve their mental health and significantly less likely to say that they are feeling down right now, plausibly leading to further reductions in the perceived need for therapy. Turning to *Stigma flag*, we see similar effects on optimism about future mental health and participants feeling down right now, again compatible with the idea that the treatment decreases the perceived need for therapy. It is easy to see how correcting pessimism about stigma may

decrease the perceived need for therapy. It is a priori less clear why *Stigma flag*, which merely focuses attention by eliciting quantitative estimates of stigma should have this effect. A plausible ad hoc explanation points to the mechanisms driving the positive effects of cognitive behavioral therapy and the idea that explicitly engaging with frightening thoughts can improve mental health (González-Sanguino et al., 2023).

Previous studies in psychology have mainly studied the correlation between perceived depression stigma and self-reported therapy demand. A majority of such studies, reviewed in Clement et al. (2015), finds no statistically significant correlation between perceived depression stigma and stated intentions to seek therapy, with only 3 out of 19 studies finding a small negative correlation. For comparability, we can look at the correlation between stigma beliefs and therapy demand in our *Stigma flag* treatment. This correlation is positive, consistent with the treatment effect heterogeneity by prior beliefs we find.

To alleviate concerns about the external validity of our measure of depression stigma, we field surveys with a sample of depressed individuals and a sample broadly representative of the US population at large. Using these samples, we show that our measure of perceived depression stigma, which allows us to quantify the extent of biases in beliefs, is strongly correlated with a standard measure of depression stigma from the psychology literature (Griffiths et al., 2004).

We also assess the external validity of the correlation between perceived stigma and self-reported measures of intentions to seek treatment, either in person or online, as commonly used in the psychology literature. Our measure of perceived stigma is not significantly correlated with these self-reported measures, consistent with prior work in psychology. This suggests that we might detect a positive correlation in the main experiment because of our

reliance on a harder outcome measure, the incentivized willingness to pay for therapy.

A growing body of evidence demonstrates that psychotherapy significantly improves well-being and productivity (Cuijpers et al., 2010; Haushofer et al., 2020; McKelway et al., 2023; Singla et al., 2017), even over long time horizons (Bhat et al., 2023). Therapy has also been shown to increase human capital investments (Barker et al., 2021), to increase parental investments (Baranov et al., 2020), and to reduce criminal activities (Blattman et al., 2017, 2022). At the same time, online mental health therapy is quickly becoming the dominant delivery mode and puts therapy within the financial reach of ever more people, while achieving similar mental health outcomes as in-person therapy (Lin et al., 2022). These parallel developments make it important to understand why a sizable portion of the depressed population refrains from seeking therapy even if they could afford to (Cronin et al., 2023).

Our paper provides causal evidence that providing good news about stigma decreases therapy demand, plausibly by reducing the perceived need for therapy. These results caution against the unintended effects of policy initiatives that seek to reduce real and perceived stigma, pointing to the inherent complexity of destigmatization processes (Negro et al., 2021). While such policies may improve the well-being of stigmatized individuals by increasing their optimism about future mental health, they may reduce therapy demand.

Our work contributes to a literature on depression and mental health in economics (Angelucci and Bennett, 2024; Banerjee et al., 2023; Cassar et al., 2022; Cobb-Clark et al., 2021; McKelway et al., 2023; De Quidt and Haushofer, 2016; Ridley et al., 2020; Shreekumar and Vautrey, 2022; Singla et al., 2017) and complements other work on the determinants of therapy demand, including studies on low mental health literacy (Acampora et al., 2022) and low perceived effectiveness of therapy (Roth et al., 2024).

Our study also speaks to a literature on the broader adverse effects of stigma that has looked at stigma in the context of sex workers (Ghosal et al., 2022), HIV testing (Yang et al., 2023; Yu, 2023), welfare recipients (Besley and Coate, 1992; Bhargava and Manoli, 2015; Lasky-Fink and Linos, 2023; Moffitt, 1983), and discrimination against the mentally ill (Ridley, 2023). We add to this literature by studying the role of stigma perceptions. We show that depressed individuals’ perception of social stigma is overly pessimistic compared to an objective benchmark, and internalized to the detriment of their self-views and well-being.

## 2 Data and design

### 2.1 Sample

We recruited 1,844 US participants using the online platform Prolific, a survey provider commonly used in social science research (Eyal et al., 2021). This data collection took place in the fall of 2022. We only include respondents that suffer from depression, identified by a score of 10 or above on the personal health questionnaire PHQ8, a widely used scale to identify depression (Kroenke et al., 2009).<sup>3</sup> Moreover, we only include respondents that have never tried therapy before.

Table A.1 compares our sample with a representative sample of people suffering from depression. We rely on a representative sample of the US population that contains data on the PHQ8, the National Health and Nutrition Examination Survey (NHANES). To make the

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<sup>3</sup>The personal health questionnaire includes nine questions, each asking about the frequency of different depressive symptoms on a scale from 0, “Not at all” to 3 “Nearly every day”. The first 8 questions of the questionnaire constitute the PHQ8, a score that ranges between 0 and 24. A score of 10 in the PHQ8 is a commonly used threshold to consider an individual currently depressed (Kroenke et al., 2009).

samples as comparable as possible, we restrict the sample to people suffering from depression according to the PHQ8. Respondents in our sample slightly under-represent women (57 percent vs 62 percent,  $p = 0.060$ ) and are significantly younger (30 vs. 50,  $p < 0.01$ ). However, our survey matches the restricted NHANES sample quite closely in terms of the PHQ8 score.

**Pre-specification.** Our main data collection was pre-registered in the AsPredicted registry (#107190).<sup>4</sup> We pre-specified the sampling procedure, the main outcomes of interest, the main right-hand-side variables of interest, and the main empirical specifications. The pre-analysis plan can be found in Section I of the Online Appendix.

## 2.2 Design

### 2.2.1 Structure of the design

At the start of the survey, we elicit a series of background characteristics as well as participants' willingness to pay for an example good. Participants are randomized into three equally-sized treatment groups. Two-thirds of our respondents answer a series of questions about other people's beliefs about people who suffer from depression. Out of those respondents, half receive information about the stigma associated with depression (*Stigma info*), while the other half do not receive the information about the stigma (*Stigma flag*). The remaining one third of respondents are assigned to a *Pure control* group that features no mention of stigma (*Pure control*). After these treatments, we elicit our respondents' willingness to pay for therapy. At the end of the experiment, we elicit an additional set of beliefs to elucidate mechanisms.

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<sup>4</sup>Our pre-registration features two separate treatment conditions with different samples conducted at the same time. The second experiment aimed to measure and debias beliefs about the effectiveness of psychotherapy Roth et al. (2024). This second experiment uses the same control group as this paper.

### 2.2.2 Beliefs about social stigma

**Pre-treatment beliefs.** To get a quantitative measure of perceived stigma, we truthfully tell our respondents that we conducted a survey with a sample of over 100 Americans whose composition resembles the American population at large. We then ask them to guess the percentage of Americans from this survey that agreed or strongly agreed with the following statement:

People with depression are lazy, hard to be around, and have weak character.<sup>5</sup>

They are informed that if their answer in the selected question is within 3 percent of the truth, they will receive a 50 cent bonus.<sup>6</sup>

On top of this quantitative question, we also elicit a qualitative question. We ask our respondents how likely it is that the majority of Americans from this survey agreed or strongly agreed with the statement on a 5-point Likert scale, ranging from (i) very unlikely to (v) very likely.

**Treatments.** Respondents in both the *Stigma info* and *Stigma flag* condition are reminded of their quantitative beliefs about social stigma:

You said that you believe that X% of Americans either agree or strongly agree with the following statement: People with depression are lazy, hard to be around, and have weak character.

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<sup>5</sup>Rather than imposing our own definition of stigma, we conducted qualitative pilots to inform our design by participants' construal of stigma. Our pilots asked respondents to describe, in their own words, how they think other people think about depressed individuals and which stereotypes they consider particularly harmful. See Appendix B.

<sup>6</sup>Respondents are told that one of the questions in which they make quantitative estimates will be randomly selected for payment. We follow best-practices and emphasize that it is in respondents' best interest to provide their best guess (Danz et al., 2022).

Respondents in the *Stigma info* condition are also told:

According to our survey of over 100 Americans, the actual share of Americans that either agree or strongly agree with this statement is 16.

Respondents in the *Stigma info* condition are also shown a chart contrasting their estimate along with the true value, while respondents in the *Stigma flag* condition are shown a chart displaying only their estimate. Respondents in the *Pure control* do not state pre-treatment beliefs and are not given any information about stigma.

**Post-treatment beliefs.** In order to mitigate experimenter demand effects, we elicit post-treatment beliefs about the stigma associated with depression based on a related but somewhat different statement about people with depression. We elicit beliefs about the percentage of Americans that agreed or strongly agreed with the following statement:

People with depression are often unreliable, incompetent, and have weak character.

To test whether our respondents extrapolate from general beliefs about stigma to beliefs about the stigma they face personally, we ask them whether people they regularly interact with would hold negative views about them if they learned that they struggled with depression.

### 2.2.3 Willingness to pay elicitation

Our main outcome is our participants' willingness to pay for BetterHelp, a prominent online therapy platform in the U.S.. We inform respondents about BetterHelp's offerings, highlighting that clients can reach their therapists anytime via audio, video, or text messages in

a dedicated messaging room. Additionally, clients have the option to arrange weekly live sessions, lasting 30 to 45 minutes, for real-time communication through phone, video, or live chat. To contextualize the service's value, we mention its standard rate of \$320 for a four-week period. We then ask respondents to specify the maximum amount they are willing to pay for a four-week therapy service from BetterHelp, between \$0 and \$350. Further, we truthfully inform respondents that the stated preferences of 10 participants in our study will be actualized. We also explain the specifics of the Becker-DeGroot-Marschak (BDM) mechanism to our respondents for clarity.

Immediately after stating their willingness to pay, participants are asked for an open-ended response about the considerations underlying their valuations.

#### **2.2.4 BDM explanation**

We first explain the BDM mechanism at the very beginning of the experiment, where it is applied to determine participants' hypothetical willingness to pay for a one-month spa membership. This early explanation and example serves two purposes. First, assessing willingness to pay for an alternative good yields a potent control variable that allows us to adjust for individual variations in scale usage (Dizon-Ross and Jayachandran, 2022). Second, the initial BDM elicitation streamlines subsequent explanations regarding willingness to pay for therapy and reduces the time gap between the administered treatments and the main outcomes.

We inform participants that they will be asked to specify the maximum price they are prepared to pay for the spa membership. They understand that this exercise does not involve spending their own money. After stating their price, a computer program will randomly select

a price between \$0 and \$350. Participants are informed that if this random price exceeds their stated price, they receive the cash amount. Conversely, if the random price is lower, they gain the spa membership. We stress the importance of honestly stating the maximum price they would pay, supporting this with a simple, illustrative example. Unlike the main elicitation of willingness to pay for therapy, this willingness to pay elicitation is not implemented for any participants.

To verify participants' comprehension, we incorporate a control question. Specifically, we ask them to assess the accuracy of various statements about the payment rules, involved stakes, and potential rewards. Participants must accurately judge the truthfulness of each statement before proceeding with the survey.

## 2.3 Data quality

Our survey design sought to assure high data quality by providing respondents with monetary incentives in the elicitation of their beliefs and their willingness to pay for therapy. Several features of our data are suggestive of high data quality. First, the open-ended data reveals that respondents engaged with the question and exerted substantial effort. Respondents wrote an average of 38 words and virtually no respondents provided a nonsensical response. Second, our survey measures exhibit a high degree of internal consistency (see Appendix Table A.2). For example, the quantitative pre-treatment measure of stigma perception is highly correlated with the qualitative measure ( $\rho = 0.72, p < 0.01$ ), which is elicited on a different scale. Third, pre-treatment stigma beliefs are strongly correlated with the WTP measure ( $\rho = 0.17, p < 0.01$ ) and predictive of the effects of the information treatment (see

Section 3.2 for details).

## 2.4 Additional experiments

We ran three additional studies to probe the mechanisms and robustness of our findings. The *mechanism experiment* provides more direct evidence on how perceived stigma affects the need for therapy (see section 4). The *group therapy experiment* features online group therapy as its main outcome to explore the external validity of our findings in a more social form of therapy and to ascertain whether our incentivized willingness to pay measure predicts therapy take-up (see section 5 and Appendix D for study details). The *validation survey* validates our perceived stigma measure, further probes external validity, and helps to put our findings in the context of the extant literature (see section 5 and Appendix C for study details). Pre-registrations on AsPredicted for all these studies (#74868; #137055; #18402) can be found in Appendix I.

## 3 Main results

### 3.1 Perceived and actual depression stigma

We start by examining how perceptions of depression stigma differ from actual stigma. In an initial survey with a sample that is broadly representative of the US population, 16 percent of Americans agree with the statement that “People with depression are lazy, hard to be around, and have weak character”. Instead, respondents in our main experiment estimate that 38 percent of Americans agree with this statement. A large majority of our respondents (83

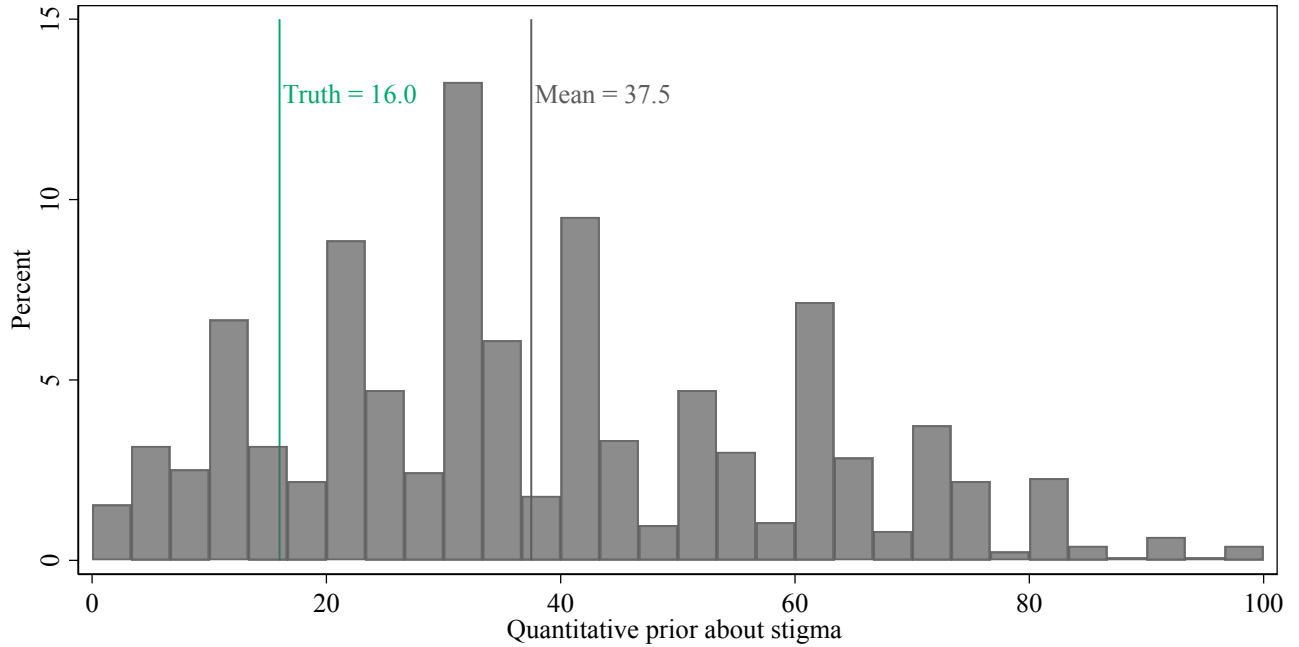


Figure 1: Prior beliefs about the prevalence of depression stigma

*Notes:* This figure displays the distribution of prior beliefs on stigma measured by asking participants what percentage of Americans agree with the statement: "People with depression are lazy, hard to be around, and have weak character." The gray vertical line indicates the mean of these prior beliefs, while the green vertical line represents the true value, based on an initial survey representative of the US population (see Online Appendix B). This distribution includes data from 1,226 observations within the *Stigma flag* and *Stigma info* treatment groups, from whom the prior beliefs were elicited.

percent) overestimate the extent of stigma. This finding implies scope for correcting average misperceptions with objective information.

The idea that depressed individuals are more pessimistic than people not suffering from depression represents a prominent hypothesis in the literature on depression (Beck et al., 1961). Here, we document pessimism in incentivized beliefs about the prevalence of depression stigma against an objective benchmark. In the validation survey, we further show that depressed individuals estimate the percentage of Americans who agree with the stigmatizing statement to be 9 percentage points higher ( $p < 0.001$ ) than non-depressed individuals do (see also Appendix C). This suggests that the relative pessimism of depressed individuals is not merely an artifact of the scale and measure we use to elicit stigma beliefs.

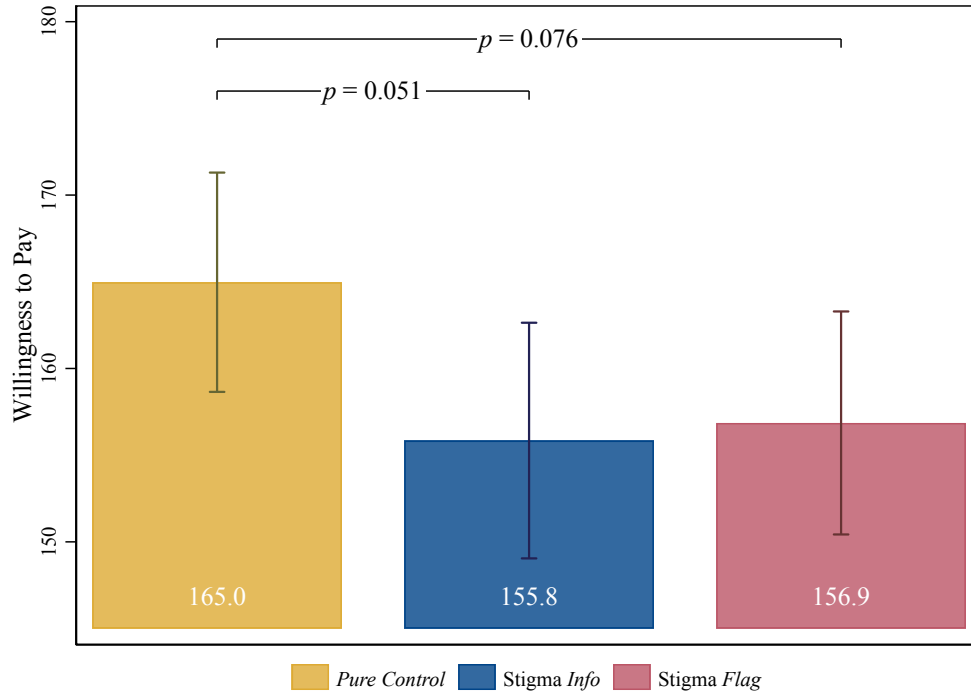
### 3.2 The effect of the information intervention

**Empirical Specification** To study the effects of our interventions on therapy demand, we estimate the following specification:

$$Y_i = \alpha_0 + \alpha_1 \text{Stigma info}_i + \alpha_2 \text{Stigma flag}_i + \Phi X_i + \varepsilon_i \quad (1)$$

where  $Y_i$  is the outcome variable of interest, e.g. stigma perceptions or respondents' willingness to pay for therapy.  $\text{Stigma info}_i$  takes value one for respondents that receive accurate information on the prevalence of depression stigma.  $\text{Stigma flag}_i$  takes value one for respondents that are prompted to think about stigma. The omitted category are respondents in the pure control group who neither are prompted to think about stigma nor receive information about it.  $X_i$  is a set of pre-specified control variables that are elicited pre-treatment, such as interest in therapy, the PHQ8 score, age and gender. For all of our analyses, we rely on robust standard errors.

**Results on beliefs** In column (1) of Appendix Table A.3, we show that *Stigma info* decreases the perceived prevalence of stigma by 16.22 percentage points ( $p < 0.01$ ). Columns (2) and (3) find similar effects of *Stigma info* on a qualitative measure of perceived stigma prevalence as well as on a quantitative measure of perceived stigma prevalence in the respondent's closer social circle. The comparison group in these first stage analyses is not the *Pure control* condition, where we took care to make no mention of stigma and consequently did not elicit stigma beliefs. Instead, we compare *Stigma info* with *Stigma flag* where we elicited stigma beliefs but did not provide information.



**Figure 2: Average treatment effects on willingness to pay for therapy**

*Notes:* This figure presents the predicted values of willingness to pay for BetterHelp, derived from a regression analysis that examines the effect of treatment status on the willingness to pay for BetterHelp among the *Pure control*, *Stigma flag*, and *Stigma info* treatment groups. The control variables used in the regressions include age, gender, PHQ8 score, willingness to pay for a month of spa membership, an indicator for prior awareness of BetterHelp, and an indicator for previous consideration of individual online therapy for depression. 95 percent confidence intervals and p-values are computed using robust standard errors from relevant regressions.

**Results on therapy demand** After establishing that the information successfully changed beliefs, we next ask whether *Stigma info* also affects the demand for therapy. Figure 2 depicts willingness to pay in the *Stigma info*, *Stigma flag*, and *Pure control* conditions. We see that *Stigma info* reduces WTP by 9.13 dollars ( $p = 0.051$ ) relative to the *Pure control* condition. Next, we find that *Stigma flag* reduces WTP by 8.12 dollars ( $p = 0.076$ ) relative to the *Pure control* condition, although the effect does not rise to statistical significance at the 5 percent level. Column 1 of Table 1 exhibits these same treatment effects of *Stigma info* and *Stigma flag*. Column 2 then shows that therapy demand in *Stigma info* and *Stigma flag* are not significantly different from each other.

We therefore see that providing accurate information about depression stigma decreases

Table 1: Treatment Effects on Willingness to Pay

	(1) Willingness to pay	(2) Willingness to pay	(3) Willingness to pay	(4) Willingness to pay	(5) Willingness to pay
<i>Stigma info</i>	-9.247** (4.676)	-1.307 (4.737)	-10.38** (5.107)	43.57*** (11.53)	22.23** (9.553)
<i>Stigma flag</i>	-7.826* (4.558)				
Prior (quant.)					0.650*** (0.157)
Prior (quant.) × <i>Stigma info</i>					-0.634*** (0.222)
Sample restriction	None	None	Prior >16	Prior ≤16	None
Excluded condition	None	<i>Pure control</i>	<i>Pure control</i>	<i>Pure control</i>	<i>Pure control</i>
Control mean	162.99	158.59	164.54	132.16	158.59
Observations	1844	1229	1019	210	1229
R <sup>2</sup>	0.257	0.229	0.237	0.272	0.240

Notes: Regressions contain preregistered controls of willingness to pay for a hypothetical example good, age, gender, openness to online therapy, and PHQ-8 score. Column 5 interacts *Stigma info* with quantitative prior about stigma. Control mean is *Stigma flag* [*Pure control*] mean for columns 2-5 [1]. Robust standard errors in parentheses, \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

the demand for therapy, shedding light on the likely effect of policy initiatives aimed at reducing perceived stigma. Moreover, we find that the negative treatment effect of *Stigma info* is substantially more pronounced among those who are more depressed, as captured by their PHQ8 score.<sup>7</sup> Figure A.1 in the Appendix shows that the estimated treatment effect rises to over 40 dollars among the most depressed and is close to zero for the least depressed. Therefore, information about stigma especially reduces therapy demand in precisely those individuals who stand to gain the most from the support of a therapist.

From the effect of *Stigma flag*, a treatment that merely draws attention to stigma without changing beliefs, we learn that the average effect of information on therapy demand can be almost completely rationalized by the effect of information on attention to stigma. Does this mean that stigma beliefs do not impact therapy demand? To investigate this question

<sup>7</sup>This analysis was not pre-registered.

we leverage a pre-registered treatment comparison that examines heterogeneous treatment effects by prior stigma beliefs. Recall that we did not elicit prior perceptions of stigma in the control condition and so cannot include it in these analyses.

Clearly, we expect the group who, based on their high priors, receives good news about stigma to respond in the opposite way of the group that, based on their low priors, receives bad news. Column 3 of Table 1 shows the effect of *Stigma info* over *Stigma flag* for participants who overestimated stigma. We see a significant 10.38 dollar decrease in their demand for therapy. Column 4 shows the effect of *Stigma info* over *Stigma flag* for prior underestimators of stigma. This group increases their demand by 43.57 dollars.

To study heterogeneous treatment effects by a continuous measure of pre-treatment perceptions, we estimate the following specification for respondents in the *Stigma info* and *Stigma flag* treatments:

$$Y_i = \alpha_0 + \alpha_1 \text{Stigma info}_i + \alpha_2 \text{Prior Stigma}_i + \alpha_3 \text{Prior Stigma}_i \times \text{Stigma info}_i + \Phi X_i + \varepsilon_i \quad (2)$$

where  $\text{Prior Stigma}_i$  is a continuous measure of pre-treatment stigma perceptions.

Column 5 shows that the effect of *Stigma info* over *Stigma flag* is decreasing in prior perceived stigma. We are left to conclude that, holding attention to stigma constant, higher perceived stigma leads to a lower demand for therapy. The reason why we do not see an average effect of *Stigma info* over *Stigma flag* is that the effect of changing the beliefs of the smaller group of overestimators (Column 4) is more than four times larger than the effect of changing the beliefs of the larger group of underestimators (Column 3), so that the two effects cancel out on average.

The literature on stigma and help-seeking in psychology has argued that stigma acts as a barrier to demand (Corrigan and Rüsch, 2002). However, the majority of (subsequent) correlational studies on the relationship between perceived depression stigma and therapy demand does not support this hypothesis (Clement et al., 2015). Stigma as a barrier to demand implies a negative effect of stigma beliefs on therapy demand. Instead, we find a positive effect and take this as strong evidence against the hypothesis. Nonetheless, for completeness we note that the stigma as a barrier to demand hypothesis is compatible with a negative treatment effect of both *Stigma info* and *Stigma flag*, if the primary effect of stigma information is not to make participants more optimistic, but to draw their attention to an ostensible barrier. To further make the case that perceived stigma does not act as a meaningful barrier to demand in our setting, the next section shows that our treatments did not affect the self-reported perception of the most important barriers to demand.

### 3.3 Do our treatments affect perceived barriers to demand

Figure 3 depicts tests for several of the mechanisms emphasized in the psychology literature (see Corrigan and Rüsch 2002) by which high perceived stigma may act as a barrier to demand. Looking at post-treatment survey measures, we find no evidence that *Stigma info* affects how comfortable participants feel to share their identity during therapy ( $0.01\sigma$ ,  $p = 0.84$ ) or to interact with a therapist ( $-0.02\sigma$ ,  $p = 0.75$ ). Neither does *Stigma info* significantly affect worry about others finding out about therapy ( $0.07\sigma$ ,  $p = 0.24$ ) and worry that seeking therapy labels the participant as depressed ( $-0.06\sigma$ ,  $p = 0.29$ ). *Stigma flag* also does not meaningfully move barriers to demand, except for a small, marginally significant, positive effect on participants'

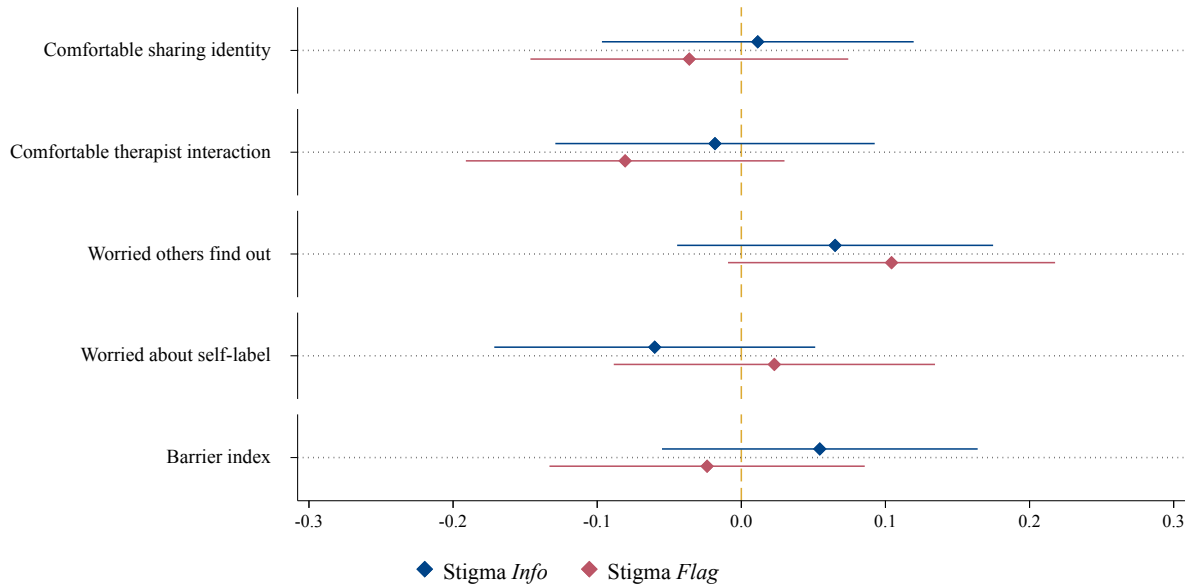


Figure 3: Effects of *Stigma info* and *Stigma flag* on measures of the mechanisms

Notes: This is a coefficient plot for the effects of the *Stigma info* and *Stigma flag* treatments, estimated against the *Pure control*—denoted by the dashed line. Dependent variables are denoted on the y-axis. For comparability of effect sizes, all outcome variables are standardized by subtracting the mean and dividing by the standard deviation of the variable in the overall sample. Control variables include age, gender, PHQ8 score, and an indicator for previous consideration of individual online therapy for depression. 95 percent confidence intervals are based on robust standard errors.

worry that others might find out about their therapy take-up ( $0.1\sigma$ ,  $p = 0.072$ ).

Next, to control for multiple hypothesis testing, we summarize our four measures into a single barrier index, where higher values imply higher perceived barriers to therapy demand. Neither *Stigma info* nor *Stigma flag* have a positive effect on the barrier index. The sum of the evidence suggests that our treatments did not systematically or meaningfully move perceived barriers to demand.

**Considerations during willingness to pay elicitation.** Data on the considerations on participants’ minds when they make their demand decision is broadly consistent with the above evidence.<sup>8</sup> A majority of participants mention concerns about effectiveness (67 percent) and financial costs (67 percent) as salient considerations informing their willingness to pay.

<sup>8</sup>This data was hand-coded by a team of research assistants.

Only a very small minority mention social stigma, even in *Stigma info* (1 percent) where the experiment features belief elicitations and information about stigma. Therefore, social stigma does not appear to affect therapy demand through easily expressed mechanisms like those relating to how others might react if they found out about therapy. Instead, taken together with the positive causal effect of stigma beliefs on therapy demand, the low prevalence of explicit mentions of stigma suggests that stigma might affect demand more indirectly, in ways that are not verbalized. Perhaps because perceived stigma has already been internalized and subsumed in feelings about oneself and one's future.<sup>9</sup>

In the next section, we describe a second data collection to explore the hypothesis that our observed treatment effects may be explained by perceived stigma affecting participants' perceived need for therapy.

## 4 Social stigma and the perceived need for therapy

To provide more direct evidence for the effect of perceived stigma on the perceived need for therapy, we conducted a mechanism experiment.

**Sample and Design.** We relied on a separate sample of 1,008 Americans suffering from depression. The experiment was conducted on Prolific in the summer of 2023. It delivers the same *Stigma info* and *Stigma flag* treatment as the main experiment and compares them to the *Pure control* condition. Our main pre-registered<sup>10</sup> outcomes are related to participants' perceived need for therapy.

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<sup>9</sup>This relates to prior findings arguing that verbal reports about some issues can be misleading and not revealing of actual underlying motives and decision processes (Nisbett and Wilson, 1977).

<sup>10</sup>See AsPredicted registry (#137055).

**Results.** The first row of Figure 4 shows the treatment effects of *Stigma info* and *Stigma flag* on agreement with the statement “Right now, I am feeling down and I don’t have the motivation to do anything about it.” on a 5-point Likert scale. This measure is meant to capture negative emotions and is similar to items on the PHQ8 scale used to diagnose depression, without being identical. We find that *Stigma info* decreases the incidence of momentary feelings of sadness and low motivation by  $0.16\sigma$  ( $p = 0.035$ ). *Stigma flag* has a similar, marginally significant effect of  $-0.13\sigma$  ( $p = 0.094$ )

The second row shows that *Stigma info* and *Stigma flag* increases agreement with the statement “Right now, I am feeling fairly good and I don’t see the need to do anything about my mental health” by  $0.11\sigma$  ( $p = 0.145$ ) and  $0.058\sigma$  ( $p = 0.44$ ) respectively, albeit not to an extent that rises to statistical significance. The third row shows that *Stigma info* and *Stigma flag* both decrease agreement with the statement “The way others view depressed people keeps me from being optimistic about improving my future mental health by myself” by  $0.20\sigma$  ( $p < 0.01$ ) and  $0.18\sigma$  ( $p = 0.02$ ) respectively. To alleviate concerns about multiple hypothesis testing, we combine our measures into a positivity index (fourth row), and find that the *Stigma info* and *Stigma flag* lead to an increase in this index by  $0.23\sigma$  ( $p < 0.01$ ) and  $0.17\sigma$  ( $p = 0.024$ ) respectively.

It is easy to see how correcting pessimism about social stigma might improve one’s mental state in the present and decrease pessimism in predicted mental health in the future. However, it is more difficult to explain the positive effects of *Stigma flag*, which merely focuses attention by eliciting quantitative estimates of stigma. A plausible ad hoc explanation points to the mechanisms driving the positive effects of cognitive behavioral therapy and the idea that explicitly engaging with frightening thoughts can improve mental health (González-Sanguino

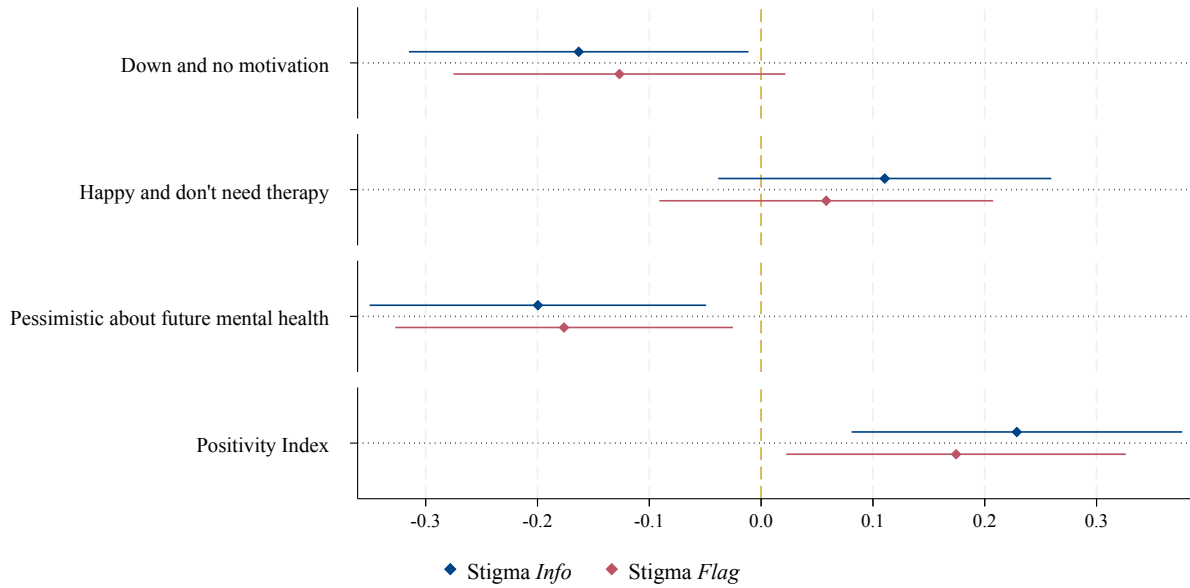


Figure 4: Effects of *Stigma info* and *Stigma flag* on emotions and beliefs

Notes: This is a coefficient plot for the effect of the *Stigma info* and *Stigma flag* treatments, estimated against the *Pure control*—denoted by the dashed line. Dependent variables are denoted on the y-axis. For comparability of effect sizes, all outcome variables are standardized by subtracting the mean and dividing by the standard deviation of the variable in the overall sample. 95 percent confidence intervals are based on robust standard errors.

et al., 2023). Consistent with this, several studies show that engaging with, accepting, and potentially reappraising an emotional stimuli is often more effective at regulating emotions than the suppression of an emotional stimulus (Hofmann et al., 2009; Webb et al., 2012).

## 5 External validity and robustness

In this section, we provide additional evidence on the external validity and robustness of our findings.

## **5.1 The effect of reducing perceived stigma on the demand for group therapy**

To examine whether the results we obtain in the setting of one-to-one online therapy extend to a setting in which the act of seeking therapy is more social, we turn to evidence from a field experiment on group therapy demand we conducted in the fall of 2021. We ran this experiment in collaboration with a provider of online group therapy by licensed therapists.

In this experiment, we document a similar first-stage of our information intervention. The information treatment significantly reduces perceived depression stigma. Our main finding from this experiment is that reducing perceived social stigma has a negative (albeit not statistically significant) effect on the demand for therapy. In analyses that impose more similar sample inclusion criteria compared to our main experiment, we even find virtually identical point estimates on the willingness to pay measure. The field experiment also allows us to gauge whether perceived stigma affects actual enrollment to group therapy. Enrollment data confirms the main finding based on willingness to pay for therapy. Taken together, this evidence suggests that positive effects of reducing stigma on the demand for group therapy are unlikely and is suggestive of the generality of our findings from the main experiment. In Appendix D, we provide additional details from this field experiment.<sup>11</sup>

## **5.2 The relationship between willingness to pay and therapy take-up**

It might be a priori unclear whether increases in willingness to pay translate into changes in actual therapy take-up. Evidence from our field experiment with the provider of group

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<sup>11</sup>The analysis of the experiment is relegated to an Appendix because difficulties in the implementation with the field partner kept us from achieving the targeted sample size, limiting the statistical power of our analyses.

therapy suggests that an increase in willingness to pay for online group therapy is significantly positively associated with the likelihood of actually signing up and enrolling in online group therapy ( $\rho = 0.171, p < 0.001$ ).

### **5.3 The relationship between our and conventional measures of perceived stigma**

Our measure of perceived stigma is empirically grounded and designed to pick up on dimensions of stigma depressed individuals identified as being particularly relevant and hurtful. Unlike other measures of perceived stigma, it is also incentivized and can be compared to a ground truth. Nonetheless, it is useful to ascertain whether this novel measure correlates with more commonly used psychological scales from the psychology literature, which have been validated according to this literature's procedures and standards. To this end, we conducted an additional survey that collects both our measure of perceived stigma and the commonly used *perceived depression stigma* scale proposed by Griffiths et al. (2004) (see Online Appendix C for further details). We document a positive correlation of 0.330 ( $p < 0.001$ ) between the two measures, corroborating the external validity of our measure.

### **5.4 How do our findings compare to the literature?**

A literature in psychology has studied the correlation between perceived depression stigma and self-reported therapy demand and finds no statistically significant correlation between the variables in 16 out of 19 and a negative correlation in 3 out of 19 studies (Clement et al., 2015). For comparability, we look at the bivariate correlation between stigma beliefs and

therapy demand in our *Stigma flag* treatment. The correlation is 0.168 ( $p < 0.001$ ), consistent with the treatment effect heterogeneity by prior beliefs.

Data from the validation survey shows that our measure of perceived depression stigma is not significantly correlated with self-reported measures of intentions to seek treatment, either online or in person. We therefore replicate the lack of a correlation in the literature between perceived stigma and therapy demand, when we use our measure of perceived depression stigma and hypothetical therapy demand. Also, this correlation is equal to zero both for online and in person therapy, suggesting that there seems to be nothing special about the former. Taken together, these data suggest that the positive correlation, found in the main study between perceived stigma and therapy demand, might be driven by our reliance on a harder (incentivized) outcome measure than previous work.

## 5.5 Alternative Explanations

### 5.5.1 Experimenter demand

We think that experimenter demand effects are unlikely in our setting for several reasons: First, we conjecture that it is more likely for participants to believe that experimenters expected positive effects of the information intervention on therapy demand. Second, heterogeneity by pre-treatment stigma perceptions suggests that our patterns could only be explained by heterogeneously occurring demand effects. Third, our willingness to pay involves real stakes making demand effects somewhat less plausible. Fourth, as outlined in more detail in Appendix E, only a very small fraction of respondents correctly guessed the study purpose<sup>12</sup>

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<sup>12</sup>This uncertainty in participants' beliefs makes experimenter demand effects less likely to constitute a threat to our findings (de Quidt et al., 2018).

and our results are not sensitive to excluding the few participants who guessed the aim of our study.

### **5.5.2 Substitution to in-person therapy**

One possible side-effect of the stigma treatment could be that people substitute from online to in-person therapy as the social cost of attending in-person therapy is more strongly reduced by the information intervention. To evaluate this conjecture, we analyze people's open-ended considerations elicited during their willingness to pay decisions. In these open-ended considerations a substantial fraction of respondents talk about substitutes to online-therapy, such as in person-therapy. However, our open-ended data reveals no significant differences by treatment in whether participants mention the in-person therapy substitute in the open-ended responses. Indeed, Appendix Table A.4 shows that the fraction of respondents who mention substitutes are close to 7 percent across treatment arms.

## **6 Conclusion**

In the United States, the market for online therapy services was valued at \$5.81 billion in 2021, with online therapy fast becoming the dominant delivery mode for counseling services. Our study set out to provide causal evidence for the effect of good news about stigma on the demand for affordable online therapy.

The extant literature views high perceived social stigma as a barrier to seeking therapy. Under this view, policies that reduce perceived stigma are predicted to increase demand and are unambiguously welfare-improving. We find that stigma information aimed at reducing

pessimism actually decreases demand. Our data further show that this effect is plausibly driven by our intervention making participants feel better about themselves and more hopeful about their future mental health, thereby reducing the perceived need for therapy.

Whether our information intervention is welfare-improving is then ambiguous. While, at least in our sample, the reduction of therapy demand our information intervention brings about is likely welfare-decreasing, the boost in well-being and hopefulness is likely to be beneficial. Future work might make progress on this critical welfare question by providing more systematic evidence on the effects of perceived social stigma on mental health and their persistence over time.

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# Online Appendix: Depression Stigma

## A Additional Tables and Figures

Table A.1: Demographics comparisons, general population and treatment conditions (means and standard errors in parentheses)

	(1) NHANES	(2) NHANES PHQ8 $\geq 10$	(3) Study Sample	(4) <i>Control</i>	(5) <i>Flag</i>	(6) <i>Info</i>	(7) p-value (2)-(3)	(8) p-value (4)-(5)-(6)
Age	49.568 (0.259)	49.604 (0.846)	30.037 (0.232)	30.550 (0.422)	29.338 (0.381)	30.225 (0.399)	0.000	0.189
Female	0.511 (0.007)	0.616 (0.023)	0.567 (0.012)	0.566 (0.020)	0.564 (0.020)	0.570 (0.020)	0.060	0.978
PHQ8 Score	3.188 (0.058)	13.575 (0.157)	14.145 (0.085)	14.148 (0.150)	14.065 (0.138)	14.221 (0.155)	0.006	0.973
Heard of BetterHelp			0.527 (0.012)	0.520 (0.020)	0.520 (0.020)	0.539 (0.020)		0.749
Insurance Covers Therapy			0.483 (0.012)	0.474 (0.021)	0.483 (0.021)	0.494 (0.021)		0.794
Observations	5068	445	1844	615	615	614		

Notes: Column 1 presents statistics for a representative sample of the U.S. population based on the 2017-2018 National Health and Nutrition Examination Survey (NHANES), excluding individuals lacking demographic data or PHQ8 responses. Column 2 consists of a subset of the NHANES sample exhibiting depressive symptoms, defined by a PHQ8 Score of 10 or above. The p-value in column 7 results from a Kruskal-Wallis test comparing the study sample (column 3) to the NHANES subset with depressive symptoms (column 2). The p-value in column 8 is based on a Kruskal-Wallis test comparing three treatment conditions presented in columns 4 to 6. Due to missing values, *Insurance Covers Therapy* contains 1,721 observations (574, 574, 573 in *Pure control*, *Stigma flag*, and *Stigma info* conditions, respectively).

Table A.2: Correlation of stigma beliefs

	(1) Prior, quantitative	(2) Prior, qualitative	(3) Posterior, quantitative	(4) Posterior, qualitative	(5) Posterior, neighborhood
Prior, quantitative	1.000				
Prior, qualitative	0.721***	1.000			
Posterior, quantitative	0.790***	0.614***	1.000		
Posterior, qualitative	0.257***	0.299***	0.330***	1.000	
Posterior, neighborhood	0.616***	0.462***	0.702***	0.433***	1.000

Notes: "Prior [Posterior], quantitative" is a response to question asking the perceived share of Americans in an initial [another] survey who agreed with the statement that people with depression are lazy, hard to be around, and have weak character [are often unreliable, incompetent, and have weak character], ranging from 0 to 100. "Prior [Posterior], qualitative" is a response to question asking the likelihood that the majority of Americans from an initial [another] survey agreed with the statements above, ranging from 1 (very unlikely) to 5 (very likely). "Posterior, neighborhood" is a response to a question asking the perceived share of people in the participants' neighborhood who agree with the statement that people with depression are often unreliable, incompetent, and have weak character, ranging from 0 to 100. \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

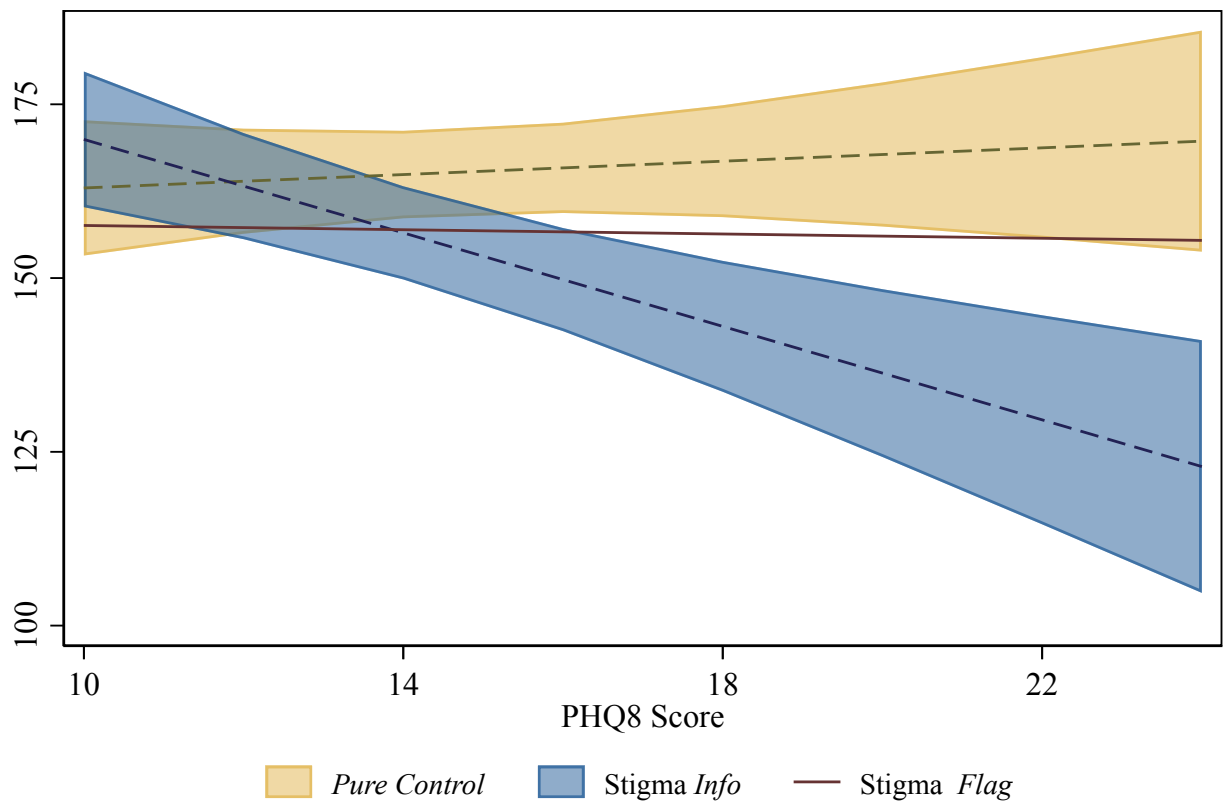


Figure A.1: Effects of *Stigma info* and *Stigma flag* on emotions and beliefs

*Notes:* This figure depicts the predicted willingness to pay for BetterHelp across different PHQ8 scores for the same groups, utilizing a regression that incorporates both the treatment indicator and its interaction with a continuous measure of PHQ8 score. The control variables used in the regressions include the PHQ8 score, willingness to pay for a month of spa membership, an indicator for prior awareness of BetterHelp, and an indicator for previous consideration of individual online therapy for depression. 95 percent confidence intervals and p-values are computed using robust standard errors from relevant regressions.

Table A.3: Treatment effect on posteriors about stigma

	(1) Posterior quantitative	(2) Posterior qualitative	(3) Posterior neighborhood
<i>Stigma info</i>	-16.22*** (0.956)	-0.205*** (0.0704)	-12.93*** (1.182)
<i>Stigma flag</i> mean	35.23	2.76	35.77
Observations	1229	1229	1229
R <sup>2</sup>	0.198	0.026	0.098

Notes: "Posterior, quantitative" is a response to question asking the perceived share of Americans in a survey who agreed with the statement that people with depression are lazy, hard to be around, and have weak character, ranging from 0 to 100. "Posterior, qualitative" is a response to question asking the likelihood that the majority of Americans from a survey agreed with the statements above, ranging from 1 (very unlikely) to 5 (very likely). "Posterior, neighborhood" is a response to a question asking the perceived share of people in the participants' neighborhood who agree with the statement that people with depression are often unreliable, incompetent, and have weak character, ranging from 0 to 100. The reference group is *Stigma flag*. Regressions contain preregistered controls of indicator for having heard of BetterHelp, openness to online therapy, and PHQ-8 score; robust standard errors in parentheses, \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

Table A.4: Balance table for open-ended data (means and standard errors in parentheses)

	(1) Whole Sample	(2) Control	(3) Flag	(4) Info	(4) p-value
Effectiveness	0.633 (0.011)	0.668 (0.019)	0.629 (0.019)	0.603 (0.020)	0.056
Financial Cost	0.689 (0.011)	0.668 (0.019)	0.683 (0.019)	0.717 (0.018)	0.172
Time	0.208 (0.009)	0.210 (0.016)	0.190 (0.016)	0.223 (0.017)	0.360
Social Concerns	0.013 (0.003)	0.005 (0.003)	0.016 (0.005)	0.018 (0.005)	0.090
Medication	0.006 (0.002)	0.005 (0.003)	0.005 (0.003)	0.008 (0.004)	0.690
Therapist	0.028 (0.004)	0.031 (0.007)	0.021 (0.006)	0.031 (0.007)	0.483
Insurance	0.095 (0.007)	0.122 (0.013)	0.096 (0.012)	0.067 (0.010)	0.004
Substitute	0.073 (0.006)	0.078 (0.011)	0.073 (0.011)	0.068 (0.010)	0.810
Low Duration	0.022 (0.003)	0.021 (0.006)	0.021 (0.006)	0.023 (0.006)	0.975
Inflation	0.012 (0.003)	0.015 (0.005)	0.013 (0.005)	0.010 (0.004)	0.736
In-Person Therapy	0.104 (0.007)	0.098 (0.012)	0.114 (0.013)	0.101 (0.012)	0.616
Observations	1844	615	615	614	

Notes: Frequency of considerations in the open-ended data, per the categorization presented in Appendix Table A.5. The p-value in the last column is from a Kruskal-Wallis test comparing the 3 groups.

Table A.5: Handcoding scheme of open-ended data on considerations of the downsides and benefits of buying therapy

Category	Description	Example Responses
Cost	Financial cost of therapy	"BetterHelp's pricing seems reasonable compared to traditional therapy, especially given its accessibility and flexibility."
Effectiveness	Focus on effectiveness of therapy	"Therapy can be life-changing, offering new perspectives and coping mechanisms that significantly improve mental health"
Inflation	Rise in costs or lower disposable incomes	"The increasing costs of living and healthcare make budgeting for therapy more challenging, especially for those with fixed incomes."
In-Person Therapy	Preference for in-person therapy sessions	"I prefer in-person therapy sessions for their personal touch and direct interaction, despite the convenience of online options like BetterHelp."
Insurance	Therapy covered by insurance	"Having therapy covered by insurance is crucial for me, as it significantly reduces the financial burden of mental health care."
Low Duration	Insufficient duration (4 weeks) for mental health improvement	"A short therapy duration might not be enough to address deep-rooted issues, raising concerns about its long-term effectiveness."
Medication	Concerns about medication	"I'm open to medication as part of my treatment plan, hoping it can provide the relief I need to function better daily."
Social Concerns	Positive or negative stereotypes about therapy and other social concerns	"There's a lingering fear that seeking therapy might lead others to perceive me as weak or unable to handle my problems on my own."
Substitute	Availability of better substitutes	"I'm exploring other options like support groups or self-help resources as alternatives to traditional therapy."
Therapist	Excitement or concerns about interacting with the therapist	"I'm looking forward to building a rapport with a therapist who can provide guidance and support through my challenges."
Time	Time commitment for therapy	"Finding time for therapy sessions is difficult with my current work and family commitments, making scheduling a key concern."

Notes: To categorize open-text responses, research assistants were provided with one-paragraph descriptions of each category and instructed to identify all categories applicable to each case.

Table A.6: Handcoding scheme of open-ended data on the perceived aim of the study

Category	Description	Example Responses
Correct Stigma	State that survey tried to measure how information about stigma in the experiment affect the valuation of therapy.	"How stigma or stereotypes associated with therapy and depression affect people's willingness to spend money on getting help."
Depression	State that survey tried to measure views about depression	"Just to understand how people view depression in the world."
Depression History	State that survey tried to study if people had depression, and how depression might impact the result	"If depressed people are more willing to spend more or less money."
Determinants of Therapy Demand	State that survey tried to measure why people seek therapy	"To see what are deciding factors as to why people choose to seek out therapy or not."
Don't Know	Indicate uncertainty	"I have no idea what the goal of this study is."
Junk	Nonsensical responses	"Too cold to type."
Marketing	Survey is a method of marketing for BetterHelp	"To get the name of BetterHelp out there."
Mental Health Awareness	Survey is interested in awareness or concerns about mental health	"Maybe it is related to how we value our mental wellness."
Opinions on Therapy	State that survey tried to measure opinions about therapy	"Seeing how people perceive therapy."
Other	Some other explanation that is not junk	"I think it was to see if people who have depression can focus on reading."
Perception of Online Therapy	Specifically mention the concept of online therapy	"To gauge people's interest in online therapy."
Perceptions of Stigma	State that survey tried to measure perceptions of social or self stigma	"How people feel about the stigma of therapy."
Perceptions of Therapy Effectiveness	State that survey tried to measure perceptions of therapy effectiveness.	"To see if people found therapy effective or not."
Valuation	State that survey tried to measure how much people are willing to pay for therapy	"I think it has something to do with seeing how people value therapy."

Notes: To categorize open-text responses, research assistants were provided with one-paragraph descriptions for each category and instructed to identify all categories applicable to each case.

## **B Stigma measurement**

### **B.1 Qualitative pilots on stigma measurement**

Rather than adopting lengthy psychometric scales (such as the often-used 20-item scale proposed by Link et al. (1989)) or imposing our own definition of stigma, we decided to conduct qualitative pilots to inform our design by participants' construal of stigma.

**Sample.** We conducted this pilot with two samples of respondents from Amazon Mechanical Turk in January 2021, both selected based on a score on their PHQ8 questionnaire greater or equal than 10. The first sample includes 103 individuals that were asked to express what depression stigma is in an open-text form. The second sample includes 97 individuals that were asked to select the harmful stereotypes that they believe to be associated with depression from a closed list.

**Qualitative question.** The first sample of respondents completes the following open-ended question:

Imagine a person with depression. What views about depressed people by others does this person worry about most?

We then carefully read through all of these responses and hand-coded them into 12 harmful stereotypes, which include: boring, cannot be trusted, childish, dangerous, hard to be around, impatient, incompetent, just pretending to be sick, lazy, overconfident, selfish, weak character. We then used these 12 harmful stereotypes in a pilot with a structured question.

**Closed question.** The second sample of respondents completes the following question:

Imagine a person with depression. What views about depressed people by others does this person worry about most? From the list below, please select the three most harmful views about depressed people.

The order of items from this list is randomized.

**Results.** Based on this structured list from the second sample of respondents, we find that the most commonly mentioned characteristics associated with depressed people were the following: weak character (37%), lazy (33%), and hard to be around (31%).<sup>1</sup> These three stereotypes come to form the statement that we use to quantify stigma:

People with depression are lazy, hard to be around, and have weak character

---

<sup>1</sup>Followed by dangerous (31%), selfish (30%), cannot be trusted (26%), just pretending to be sick (26%), incompetent (25%), boring (21%), impatient (15%), overconfident (13%), childish (12%).

## B.2 Pre-survey to quantify stigma

**Sample.** We conducted this pilot with respondents from a representative sample of the US population that were recruited on Lucid between November 2020 and January 2021.

**Design.** We asked our respondents to what extent they agree to each of the following statements:

1. People with depression are lazy, hard to be around, and have weak character (517 observations).
2. People with depression are often unreliable, incompetent, and have weak character (235 observations).

Whereby 1. follows from the preliminary work described in the previous section and 2. captures stereotypes that are particularly harmful in the workplace. They respond on a 5 point-scale (Strongly agree, Agree, Neither agree nor disagree, Disagree, Strongly disagree).

**Results.** We find the following distribution of responses. For the first statement: 5% strongly agree, 11% agree, 20% neither agree nor disagree, 30% disagree, 34% strongly disagree. For the second statement: 7% strongly agree, 19% agree, 19% neither agree nor disagree, 23% disagree, 32% strongly disagree.

## C Perceived stigma validation survey

In the summer of 2024 we collected an additional survey to validate our measure of perceived depression stigma against the more established measure by Griffiths et al. (2004). This

survey is collected on Prolific, where we recruit both a sample of 996 individuals that is representative of the U.S. population on sex, age, and race, as well as a “depressed” sample of 1022 individuals with a PHQ8 $\geq$ 10. This survey was pre-registered on AsPredicted #184021.

Perceived depression stigma from Griffiths et al. (2004) is built on a 9-item instrument in which respondents are asked to what extent they agree with each of the following statements.

1. Most people believe that people with depression could snap out of it if they wanted
2. Most people believe that depression is a sign of personal weakness
3. Most people believe that depression is not a real medical illness
4. Most people believe that people with depression are dangerous
5. Most people believe that it is best to avoid people with depression so you don’t become depressed yourself
6. Most people believe that people with depression are unpredictable
7. If they had depression, most people would not tell anyone
8. Most people would not employ someone they knew has been depressed
9. Most people would not vote for a politician they knew had been depressed

In a corresponding *Personal depression stigma* instrument, each of these questions has a counterpart in first person that captures the respondent’s own stigmatization of depression.

We find that there is a strong correlation between our measure of perceived depression stigma and the one proposed by Griffiths et al. (2004), both in the representative sample ( $\rho = 0.393, p < 0.001$ ) and in the fraction of the depressed sample that never experience therapy ( $\rho = 0.330, p < 0.001$ ).<sup>2</sup> This finding demonstrates the broad validity of our measure.

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<sup>2</sup>The latter reflect the sample composition of our main experiment. A similar correlation holds also among depressed individuals who did experience therapy before ( $\rho = 0.356, p < 0.001$ ).

We find in the representative sample that on average 32 percent of non-depressed respondents believe that Americans view depressed individuals as lazy, hard to be around, and as having weak character. The extent of perceived stigma among non-depressed respondents is significantly larger than the true state of the world (of 16 percent), but also significantly smaller ( $p < 0.001$ ) than among depressed respondents – who believe that 41 percent of Americans have such stigmatizing views of depressed people. These findings demonstrate that pessimism around depression stigma is a widespread phenomenon that is particularly pronounced among depressed people. From the elicitation of Personal depression stigma, we find no difference on this outcome between depressed and non-depressed respondents ( $p = 0.862$ ), which we interpret as showing that the differential pessimism between depressed and non-depressed individuals is not reflective of their own stigmatizing thoughts but rather of their beliefs about others.

Finally, this survey allows us to examine the surprising finding in our main study that perceived stigma is positively correlated with the demand for therapy. One might be concerned that this finding is unique to our particular sample (depressed people who never got therapy) or to the type of therapy that we offered (online therapy). To bear systematic evidence on the question of external validity, the survey includes a hypothetical demand for therapy and we randomize in a between-subject fashion whether the therapy service offered is in-person or online. Therefore, we can estimate the correlation between demand and perceived stigma separately for depressed people who experienced therapy and for those who did not, when the hypothetical outcome refers to online therapy and when it refers to in-person therapy. In all four cases this correlation is directionally positive but not statistically significant. We interpret the lack of evidence for a negative correlation between therapy

demand and perceived stigma as generally supporting the external validity of our findings.

## D Group therapy experiment

In this section, we describe an experiment on group therapy.

### D.1 Sample

Respondents were recruited primarily in New York State using Prolific, Dynata and CloudResearch, as most of our partner’s therapists only have licenses to practice therapy sessions in New York State.<sup>3</sup> This recruitment took place in the fall of 2021. Moreover, we only included participants who qualify as depressed based on having a PHQ8 score of 10 or above and who had pessimistic pre-treatment beliefs about stigma. Because we hypothesized that increasing perceived stigma would decrease demand and be unambiguously disadvantageous to participants, we did not include participants for whom accurate information would have been bad news. As a result of these restrictions on the recruitment pool, we managed to recruit only 1100 participants, which is substantially less than we aimed for, even though we recruited participants over a period of several months.<sup>4</sup>

### D.2 Design

**Treatment groups.** Our main treatment administered information about stigma in exactly the same way that our main experiment did. Participants in a control condition stated their

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<sup>3</sup>A few respondents were recruited from neighboring US states.

<sup>4</sup>This experiment was pre-registered on aspredicted #74868.

pre-treatment beliefs about stigma, but did not receive information. This condition was, therefore, similar to the *Stigma flag* condition in the main experiment.

**Group therapy.** The key difference of this experiment is that rather than eliciting willingness to pay for one-on-one online therapy, we offered respondents online group therapy from a prominent online group therapy service based in the US. This provider offers treatment for a wide range of diagnoses and life challenges, including anxiety, depression, and relationship issues, among others. The service primarily consists of one-hour weekly sessions of group cognitive-behavioral therapy, led by a licensed therapist. An initial consultation allows new subscribers to sort into the group that best suits them. Each group has at most twelve members, who take part in the session via Zoom. Participants can always choose how much to interact during the session depending on how much they have to say or how comfortable they feel, and they can choose to be anonymous to the rest of their group by using a nickname when they enter the Zoom meeting.

**Pre-registered outcomes.** Our main outcome measures willingness to pay for therapy, elicited using a 31-item multiple price list (where the monetary alternative to therapy ranges from 0\$ to 300\$, in 10\$ increments). Every participant had one decision implemented at random, and received either a voucher for therapy or money depending on their choice. Among those who received a voucher for therapy, we also measured whether they enrolled in the therapy service that we offered, in which case we covered their cost. Our software selects with probability 90 percent the choice between 0\$ and therapy, which comes with the two main advantages of (a) maximizing access to therapy and (b) allowing us to investigate

the correlation between willingness to pay and actual enrollment net of mechanical effects. We also collected information on whether participants showed up for therapy sessions, but problems on behalf of the provider with scheduling sessions may make this data unreliable.

### D.3 Results

Table D.1 presents the results of the group therapy experiment. Column 1 features a manipulation check and shows that the information significantly reduced posterior beliefs about stigma. Column 2 shows a small negative effect of correcting stigma on willingness to pay that is statistically indistinguishable from zero. Column 3 repeats the analysis, but restricts the sample to those who are not already being treated for mental health problems. This is what we did and pre-registered in our main experiment with BetterHelp. However, this sample restriction was not pre-registered in the group therapy experiment. In this sub-sample, reducing perceived stigma leads to a reduction of willingness to pay by 10.24 dollars, although the effect is not statistically significant at conventional levels. The relevant point of comparison with our main experiment is given by column 3 of Table 1, where we present the treatment difference between *Stigma info* and *Stigma flag* for participants with pessimistic priors and find that *Stigma info* reduced WTP by 10.38 dollars, a strikingly similar point estimate.

There are several potential reasons for why estimates in the group therapy experiment appear to be more noisy than in the main experiment. Two reasons stand out. First, we did not elicit and include as a control willingness to pay for an example good, a strategy that has been shown to improve the statistical power of analysis that feature willingness to pay measures as an outcome variable. Second, 381 participants seem to categorically dislike group

Table D.1: Treatment effect on posterior beliefs and willingness to pay

	(1)	(2)	(3)	(4)	(5)
	Posterior belief	Willingness to pay	Willingness to pay	Enrollment to therapy	Enrollment to therapy
<i>Stigma info</i>	-20.10*** (1.174)	-1.809 (5.965)	-10.24 (6.989)	-0.00444 (0.0184)	-0.0165 (0.0209)
Sample restriction	None	None	Not being treated	0\$ choice	Not being treated; 0\$ choice
<i>Stigma flag</i> mean	47.00	70.28	68.04	0.0948	0.0836
Observations	1100	1100	708	993	636
R <sup>2</sup>	0.206	0.000	0.003	0.000	0.001

Notes: The reference group is *Stigma flag*. Sample contains only participants with pessimistic prior. Column 3 restricts the sample to those not currently being treated for mental health; column 4 restricts the sample to those for whom the choice implemented for payoff was the one between 0\$ and therapy; column 5 combines the restrictions in columns 3 and 4. Regressions do not contain controls; robust standard errors in parentheses; \* p<0.1, \*\* p<0.05, \*\*\* p<0.01.

therapy and are not willing to pay anything for it. Others already use alternative forms of therapy. So, the group of participants whose demand our treatment could reasonably affect is small, thereby reducing our effective sample size.

Column 4 shows that *Stigma info* has a negative but close-to-zero effect on whether participants who received the voucher sign up for the therapy service. Column 5 repeats the analysis for only those who are not currently under alternative treatment for mental health problems, finding a somewhat more negative yet still statistically insignificant effect.<sup>5</sup> These results line up with the analyses that use willingness to pay as the outcome variable. In both cases, we do not observe significant negative effects. Yet our results rule out meaningful positive effects of reduced stigma on the demand for group therapy that are hypothesized in the extant literature.

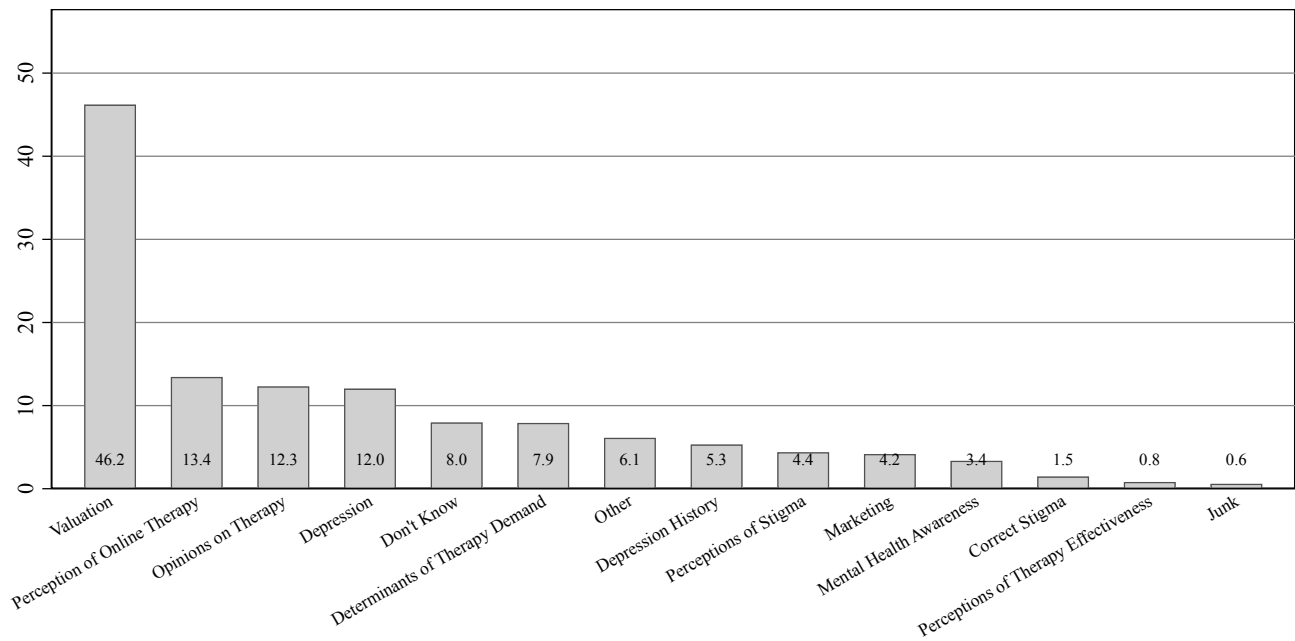
<sup>5</sup>Only participants for whom a multiple price list scenario that had them receive the therapy voucher was realized had a choice of whether or not to go through the process of enrolling in the service. Realized scenarios were drawn randomly from a very skewed distribution that featured a “price of zero” scenario 90 percent of the time. Our analysis in columns 4 and 5 looks at the ninety percent of participants who received the voucher regardless of their stated willingness to pay.

## **D.4 Does willingness to pay predict enrollment?**

The group therapy experiment allows us to speak to the external validity of our willingness to pay measure because we observe it alongside the real outcome of participants who actually fill out the forms required to enroll in the online group therapy service and subsequently choose to enroll. We see that willingness to pay and enrollment exhibit a correlation of 0.171 ( $p < 0.001$ ), thereby increasing our confidence in the ecological validity of our WTP measure.

## **E Experimenter demand effect**

To examine the potential role of experimenter demand effects, we rely on an open-ended question: “Please describe in a few words what you think the aim was of the research conducted through this survey.” Appendix Figure E.1 shows that only 2.2 percent of respondents correctly guessed our study’s purpose, i.e., studying the effects of perceived social stigma on therapy demand; 5.8 percent of respondents guessed that the study purpose was studying perceptions of stigma. The vast majority of responses are very unspecific: 42 percent of respondents mention that the survey tried to measure people’s valuation of therapy. 16.5 percent mention that the survey was about depression, 12 percent thought it was about perceptions of online therapy and 11.8 percent believed that it was about opinions on therapy. 8.4 percent of respondents explicitly indicate that they are quite unsure about the purpose. Table E.1 shows that our main treatment effects are robust to excluding those respondents that correctly guessed the study hypothesis or believed that the study purpose was about stigma perceptions. In light of the evidence on the muted quantitative importance of experimenter



**Figure E.1: Open-text responses when participants are asked to guess the research objective**

*Notes:* The bars represent the fractions of respondents (1844 observations) who mentioned a given category in their written responses when asked what they thought the study is about.

demand effects (de Quidt et al., 2018) and the above findings, experimenter demand effects seem less likely to account for the treatment effects we uncover in our experiment. At the same time, we acknowledge that we cannot fully rule them out.

Table E.1: Treatment Effect on Willingness to Pay: Experimenter Demand Effect Robustness Check

	(1) Willingness to pay	(2) Willingness to pay
<i>Stigma info</i>	-9.224** (4.675)	-8.879* (4.824)
<i>Pure control mean</i>	162.99	163.57
Observations	1229	1171
R <sup>2</sup>	0.258	0.257

*Notes:* Regressions contain preregistered controls of willingness to pay for a hypothetical example good, age, gender, and openness to online therapy, participants PHQ-8 score. Column 2 excludes the respondents that correctly guessed the study hypothesis or believed that the study purpose was about stigma perceptions. Robust standard errors in parentheses; \*  $p < 0.1$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .

## F Instructions: main experiment

### Consent

Thank you for taking part in this survey. You must be 18 or above to participate. You are not allowed to participate in this study more than once. The survey takes just a few minutes. If you decide to participate in the survey, then we ask you to take all questions seriously. Data is collected for the purpose of research. Keep in mind that your participation is voluntary and that you can decide to withdraw from the study at any point. At the end of the survey, we may offer you a health service to which you may enroll for 4 weeks. This service is sponsored by a research grant so that you will not have to pay anything out of pocket. All information is treated as highly confidential. Note that there will be no deception in the instructions. Everything we tell you about the tasks you face will be implemented in the exact way we tell you. Any analysis and publication will only use data in anonymous form. This study was cleared by the ethics committee of the University of Essex.

If you experience a technical error or problem, then do not try to restart or retake the study. Rather, send us an email with a description of your problem and we will get back to you. For any question or complaint, please contact Xredacted\_for\_peer\_reviewX (XredactedX@gmail.com). By clicking on “Yes, I consent to participate in the study” you give your consent to take part in the study.

*[Yes, I consent to participate in the study; No, I would not like to participate in the study]*



### Attention screener

The next question is about the following problem. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and just quickly click through

the survey. This means that there are a lot of random answers which compromise the results of research studies. To show that you read our questions carefully, please enter 333 as your answer to the next question. Given the above, what is your favorite number?

*[Number]*



## **Demographics**

What is your age?

*[Dropdown list of possible ages]*

What is your gender?

*[Male; Female; Non-binary]*

In which state do you currently reside?

*[Dropdown list of possible states]*



## **Personal health questions**

Over the last 2 weeks, how often have you been bothered by any of the following problems?

- Little interest or pleasure in doing things
- Feeling down, depressed, or hopeless
- Trouble falling or staying asleep, or sleeping too much
- Feeling tired or having little energy
- Poor appetite or overeating
- Feeling bad about yourself or that you are a failure or have let yourself or your family down
- Trouble concentrating on things, such as reading the newspaper or watching television

- Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety restless that you have been moving around a lot more than usual
- Thoughts that you would be better off dead, or of hurting yourself in some way

*[Not at all; Several days; More than half of the days; Nearly every day]*



The previous questions are commonly used to measure depression. By depression we mean a mental disorder that can be characterized by sadness, a lack of interest and a loss of pleasure, feelings of guilt and low self-esteem, sleep disorders, loss of appetite, tiredness and poor concentration.



We will now ask you a few additional questions about depression.

- Have you ever been diagnosed with depression?
- Have you ever overcome depression?
- Have you ever attended psychological therapy for depression?
- Are you currently undergoing any form of treatment for depression (e.g. psychological therapy)
- Do you have health insurance that covers psychological therapy?
- Would you ever consider taking part in individual online therapy for depression?

*[Yes; No]*



Do you want to continue participating in this study, answer additional questions for 5 more minutes, and receive a \$1.2 bonus for your participation?

*[Yes, I will take part in this 5 minute survey for a \$1.2 bonus; No, I don't want to participate]*



## Explanation for WTP

HOW MUCH ARE YOU WILLING TO SPEND? During this experiment, we may ask you how much you would be willing to pay for certain products or services. These decisions may have real consequences in that they will actually be implemented for some participants in the survey. Let us take you through a hypothetical example to explain how this kind of buying decision will play out. Please make sure you understand the example. Example: How much would you spend on a 1 month spa membership? Suppose the product in question is a one month membership at a spa in your area, valued at 250 dollar. The membership entitles you to use a sauna, an indoor swimming pool, and to receive one free massage a week.

We will ask you for the maximum amount of money you would be willing to pay for the membership. We call this amount your valuation. You will state your valuation using a slider. You will not have to use your own money to buy the product. After you stated your valuation, the computer will randomly pick a dollar amount between 0 and 300. If this dollar amount is larger than your valuation, then the dollar amount will be paid out to you. If the dollar amount is smaller than your valuation, then you will receive the spa membership.

This rule means that it is in your best interest to state the maximum amount of money you would be willing to pay for the product. To see why, consider the case where you selected a number smaller than your true valuation. Then there is a chance that the computer picks a dollar amount that is larger than your chosen amount, but smaller than your true valuation. Receiving this dollar amount means that you would have been better off stating your true valuation, which would have resulted in you receiving the product. Remember, during the survey the buying decision of some participants will actually be implemented. Depending on their decisions and the random dollar amount generated by the computer, these participants will then either receive money or the product.

## Control question

- ☐ Given the payment rule, it is in my best interest to state the largest amount of money that I would be willing to pay for the product.
- ☐ My buying decision during the survey may have real consequences because it may be implemented.
- ☐ If my decision is implemented, then I will either receive money or the product, depending on my choices.

## Practice question

Just for practice, please state your valuation: On the slider below, indicate the maximum amount of money you would pay for the one month spa membership? (Please give us your best answer)

My valuation is \_\_

*[Slider from 0 to 300]*



### **Explanation of incentives**

#### **WHAT IS YOUR BEST GUESS?**

Some of the questions that follow will ask you to make estimates and will be marked with a \$ sign. One of these questions will be randomly selected for payment, regardless of whether your buying decision is implemented. If your answer in the selected question is within 3 percent of the truth, then you will receive a \$0.50 dollar bonus. Therefore, it is in your best interest to provide your best guess.



### **Prior stigma**

We recently conducted a survey with a sample of over 100 Americans. The composition of this sample resembles the American population at large.

\$ What percentage of Americans from this survey would you say agreed or strongly agreed with the following statement?

"People with depression are lazy, hard to be around, and have weak character."

*[Number from 0 to 100]*

Here is a related question. How likely is it that the majority of Americans from this survey agreed or strongly agreed with the following statement?

"People with depression are lazy, hard to be around, and have weak character."

*[Very unlikely; Unlikely; Neither likely nor unlikely; Likely; Very likely]*



### **Stigma flag**

You said that you believe that XX% of Americans either agree or strongly agree with the following statement:

"People with depression are lazy, hard to be around, and have weak character."

At the end of this study we will send you the correct answer to this question as a private message on Prolific.

## Stigma information

You said that you believe that XX% of Americans either agree or strongly agree with the following statement:

"People with depression are lazy, hard to be around, and have weak character."

According to our survey of over 100 Americans, the actual share of Americans that either agree or strongly agree with this statement is XX%.



## Post-treatment stigma beliefs

\$ We recently conducted another survey with a sample of over 100 Americans. The composition of this sample resembles the American population at large. What percentage of Americans from this survey would you say agreed or strongly agreed with the following statement?

"People with depression are often unreliable, incompetent, and have weak character."

*[Number from 0 to 100]*



Next, suppose that we conducted the same survey with 100 people from your neighborhood. What percentage of these people would you say would agree or strongly agree with the following statement?

"People with depression are often unreliable, incompetent, and have weak character."

*[Number from 0 to 100]*



How likely do you think it is that people you regularly interact with would hold negative views about you if they learned that you struggled with depression?

*[Very unlikely; Unlikely; Neither likely nor unlikely; Likely; Very likely ]*



## Betterhelp

On the next screen we introduce BetterHelp, one of the leading online therapy services in the United States. We will then ask you some questions to understand how valuable you find this type of service. This is not promotional material.

Have you ever heard of BetterHelp?

*[Yes; No]*



betterhelp.com is an online therapy service. They offer treatment for a wide range of diagnoses and life challenges, including anxiety, depression, and relationship issues, among others. You can send audio, video, or text messages to your therapist at any time in the messaging room. You can also schedule weekly live sessions (30 to 45 min) with your therapist to communicate via phone, video, or live chat. If you don't like your therapist, you can ask to be matched to a different therapist. BetterHelp has over 25,000 therapists with different qualifications and areas of expertise.



## Willingness to pay

We will now ask you about the maximum amount of dollars you are willing to spend on four weeks of therapy from BetterHelp. This service is normally priced at \$320 for 4 weeks.

Please indicate the maximum dollar amount you are willing to spend, your valuation, using the slider below. The choice of 10 participants in this study will be implemented. If your choice is implemented, then you will either receive a voucher for four weeks of therapy from BetterHelp or a dollar amount, based on the payment rule we explained to you at the beginning of the survey. (Remember: After you stated your valuation, the computer will randomly pick a dollar amount between 0 and 350. If this dollar amount is larger than your valuation, then the dollar amount will be paid out to you. If the dollar amount is smaller than your valuation, then you will receive therapy from BetterHelp.) You will find out whether your choice was implemented and whether you receive money or therapy at the end of the survey.

It is not important that you understand the details of the payment rule, just remember that it is in your best interest to state your true valuation.

Your decision

What is your valuation, i.e., the maximum amount of money you would pay for the four weeks of therapy from BetterHelp?

My valuation is \_\_

*[Slider from 0 to 350]*



### **Considerations (open-ended)**

What considerations do you have on your mind when choosing how much you would be willing to spend on 4 weeks of online therapy from BetterHelp? Please write 2-3 sentences. You may mention both downsides and benefits of buying therapy (if any were on your mind).

*[Open text]*



### **Considerations (structured)**

On the previous page you provided the following considerations. Please select from the list below the considerations you had in mind when you wrote this. Please tick all that apply.

- ☐ Hard to make time for therapy
- ☐ Easy to make time for therapy
- ☐ Afraid of meeting the therapist
- ☐ Looking forward to interacting with the therapist
- ☐ Afraid of what other people will think of me
- ☐ Happy to show others I am taking care of myself
- ☐ Afraid of medication
- ☐ Hopeful of receiving help in the form of medication
- ☐ High financial cost of therapy
- ☐ Low financial cost of therapy

- ☐ High effectiveness of therapy
- ☐ Low effectiveness of therapy
- ☐ Negative stigma about people seeking therapy
- ☐ Positive stereotypes about people seeking therapy
- ☐ None of the above



Did you find the way in which you were asked to state your valuation of 4 weeks of Better-Help therapy confusing?

*[Very confusing; Confusing; Slightly confusing; Not at all confusing]*



### **Post main outcomes**

Please describe in a few words what you think the aim was of the research conducted through this survey.

*[Open text]*



To what extent do you agree with each of the following statements about yourself?

- I am often unreliable
- I am often incompetent
- My behavior is sometimes unpredictable
- Generally speaking, I have a weak character
- I am often lazy
- I am often hard to be around

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



Imagine that you decide to seek treatment in the form of online therapy. How worried would you be about any problems caused by coworkers, friends, or family finding out about your seeking therapy.

*[Not worried at all; Slightly worried; Somewhat worried; Moderately worried; Very worried]*



Imagine that you decide to seek treatment in the form of online therapy. How effective do you think completing therapy would be for you in overcoming depression?

*[Very effective; Effective, Somewhat effective; Ineffective; Very ineffective)]*



Imagine that you decide to seek treatment in the form of online therapy. How would you feel about having to interact with the therapist?

*[Very comfortable; Mostly comfortable; Neither comfortable nor uncomfortable; Moderately uncomfortable; Very uncomfortable]*



Imagine that you decide to seek treatment in the form of online therapy. How would you feel about sharing your identity during sessions?

*[Very comfortable; Mostly comfortable; Neither comfortable nor uncomfortable; Moderately uncomfortable; Very uncomfortable]*



To what extent do you agree with the following statement?

"If I were to seek treatment, then that would label me as depressed, which would make me feel worse about myself."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



How painful is it for you to think about potential problems with your mental health and what they entail for your life?

*[Very painful; Painful; Slightly painful; Not painful at all]*



How relevant did you find the information on effectiveness provided in this survey?

*[Very relevant; Relevant; Slightly relevant; Not relevant at all]*



How trustworthy did you find the information on effectiveness provided in this survey?

*[Very trustworthy; Trustworthy; Neither trustworthy nor untrustworthy; Untrustworthy; Very untrustworthy]*



To what extent would you say that you paid close attention to the instructions throughout the survey? The answer to this question does not affect your task approval or earnings.

*[To a great extent; Somewhat; Little; Not at all]*

## G Instructions: mechanism experiment

### Consent

Thank you for taking part in this survey. You must be 18 or above to participate. You are not allowed to participate in this study more than once.

The survey takes just a few minutes. If you decide to participate in the survey, then we ask you to take all questions seriously. Data is collected for the purpose of research. Keep in mind that your participation is voluntary and that you can decide to withdraw from the study at any point.

Note that there will be no deception in the instructions. Everything we tell you about the tasks you face will be implemented in the exact way we tell you. Any analysis and publication will only use data in anonymous form. This study was cleared by the ethics committee of the University of Essex.

If you experience a technical error or problem, then do not try to restart or retake the study. Rather, send us an email with a description of your problem and we will get back to you. For any question or complaint, please contact Xredacted\_for\_peer\_reviewX (XredactedX@gmail.com). By clicking on “Yes, I consent to participate in the study” you give your consent to take part in the study.

*[Yes, I consent to participate in the study; No, I would not like to participate in the study]*



### Attention screener

The next question is about the following problem. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and just quickly click through the survey. This means that there are a lot of random answers which compromise the results of research studies. To show that you read our questions carefully, please enter 333 as your answer to the next question. Given the above, what is your favorite number?

*[Number]*



## Demographics

What is your age?

*[Dropdown list of possible ages]*

What is your gender?

*[Male; Female; Non-binary]*

In which state do you currently reside?

*[Dropdown list of possible states]*



## Personal health questions

Over the last 2 weeks, how often have you been bothered by any of the following problems?

- Little interest or pleasure in doing things
- Feeling down, depressed, or hopeless
- Trouble falling or staying asleep, or sleeping too much
- Feeling tired or having little energy
- Poor appetite or overeating
- Feeling bad about yourself or that you are a failure or have let yourself or your family down
- Trouble concentrating on things, such as reading the newspaper or watching television
- Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety restless that you have been moving around a lot more than usual
- Thoughts that you would be better off dead, or of hurting yourself in some way

*[Not at all; Several days; More than half of the days; Nearly every day]*



The previous questions are commonly used to measure depression. By depression we mean a mental disorder that can be characterized by sadness, a lack of interest and a loss of pleasure, feelings of guilt and low self-esteem, sleep disorders, loss of appetite, tiredness and poor concentration.



We will now ask you a few additional questions about depression.

- Have you ever been diagnosed with depression?
- Have you ever overcome depression?
- Have you ever attended psychological therapy for depression?
- Are you currently undergoing any form of treatment for depression (e.g. psychological therapy)
- Do you have health insurance that covers psychological therapy?
- Would you ever consider taking part in individual online therapy for depression?

*[Yes; No]*



Do you want to continue participating in this study, answer additional questions for 5 more minutes, and receive a \$1.2 bonus for your participation?

*[Yes, I will take part in this 5 minute survey for a \$1.2 bonus; No, I don't want to participate]*



### **Betterhelp**

On the next screen we introduce BetterHelp, one of the leading online therapy services in the United States. We will then ask you some questions to understand how valuable you find this type of service. This is not promotional material.

Have you ever heard of BetterHelp?

*[Yes; No]*



betterhelp.com is an online therapy service. They offer treatment for a wide range of diagnoses and life challenges, including anxiety, depression, and relationship issues, among others. You can send audio, video, or text messages to your therapist at any time in the messaging room. You can also schedule weekly live sessions (30 to 45 min) with your therapist to communicate via phone, video, or live chat. If you don't like your therapist, you can ask to be matched to a different therapist. BetterHelp has over 25,000 therapists with different qualifications and areas of expertise.



### **Explanation of incentives**

#### **WHAT IS YOUR BEST GUESS?**

Some of the questions that follow will ask you to make estimates and will be marked with a \$ sign. One of these questions will be randomly selected for payment, regardless of whether your buying decision is implemented. If your answer in the selected question is within 3 percent of the truth, then you will receive a \$0.50 dollar bonus. Therefore, it is in your best interest to provide your best guess.



### **Prior stigma**

We recently conducted a survey with a sample of over 100 Americans. The composition of this sample resembles the American population at large.

\$ What percentage of Americans from this survey would you say agreed or strongly agreed with the following statement?

"People with depression are lazy, hard to be around, and have weak character."

*[Number from 0 to 100]*



Here is a related question. How likely is it that the majority of Americans from this survey agreed or strongly agreed with the following statement?

"People with depression are lazy, hard to be around, and have weak character."

*[Very unlikely; Unlikely; Neither likely nor unlikely; Likely; Very likely ]*

### **Stigma flag**

You said that you believe that XX% of Americans either agree or strongly agree with the following statement:

"People with depression are lazy, hard to be around, and have weak character."

At the end of this study we will send you the correct answer to this question as a private message on Prolific.

### **Stigma information**

You said that you believe that XX% of Americans either agree or strongly agree with the following statement:

"People with depression are lazy, hard to be around, and have weak character."

According to our survey of over 100 Americans, the actual share of Americans that either agree or strongly agree with this statement is XX%.



### **Post-treatment stigma beliefs**

\$ We recently conducted another survey with a sample of over 100 Americans. The composition of this sample resembles the American population at large. What percentage of Americans from this survey would you say agreed or strongly agreed with the following statement?

"People with depression are often unreliable, incompetent, and have weak character."

*[Number from 0 to 100]*



Next, suppose that we conducted the same survey with 100 people from your neighborhood. What percentage of these people would you say would agree or strongly agree with the following statement?

"People with depression are often unreliable, incompetent, and have weak character."

*[Number from 0 to 100]*



How likely do you think it is that people you regularly interact with would hold negative views about you if they learned that you struggled with depression?

*[Very unlikely; Unlikely; Neither likely nor unlikely; Likely; Very likely]*



## **Emotions**

To what extent do you agree with the following statement?

"Right now, I am feeling down and I don't have the motivation to do anything about it."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



To what extent do you agree with the following statement?

"Right now, I am feeling fairly good and I don't see the need to do anything about my mental health."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



## **Post outcomes**

Do you agree with the following statement?

"At this point, I have a fairly good idea of how Americans view depressed people."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



The next couple of statements concern how society's current views of depressed individuals affect your expectations and plans. To what extent do you agree with the following statements:

- "The way others view depressed people keeps me from being optimistic about improving my future mental health by myself."

- "The way others view depressed people keeps me from seeking help from my social circle when my mental health is not good."
- "The way others view depressed people makes me feel that depression is rather common and normal and not something that needs to be treated with therapy."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



We recently conducted a survey with a sample of over 100 Americans. The composition of this sample resembles the American population at large. Participants were asked the same questions about depression symptoms you were asked at the beginning of your survey today, i.e., about negative symptoms like having little interest in doing things and having trouble concentrating etc.

What percentage of Americans from the survey would you say reported depression symptoms that are as severe as or more severe than yours?

*[Number from 0 to 100]*

People who report having many of the depression symptoms on several or even most days, are diagnosed as being depressed. In light of this, what percentage of Americans from the survey would be diagnosed as being depressed?

*[Number from 0 to 100]*

## H Instructions: group therapy experiment

### Consent

Thank you for taking part in this survey. You must be 18 or above, and currently reside in New York State to participate. You are not allowed to participate in this study more than once.

The survey takes just a few minutes. If you decide to participate in the survey, then we ask you to take all questions seriously. Data is collected for the purpose of research. Keep in mind that your participation is voluntary and that you can decide to withdraw from the study at any point.

At the end of the survey, we may offer you a health service to which you may enroll for 8 weeks. This service is sponsored by a research grant so that you will not have to pay anything out of pocket. The service provider may share information about your service usage with us. All information is treated as highly confidential.

Note that there will be no deception in the instructions. Everything we tell you about the tasks you face will be implemented in the exact way we tell you. Any analysis and publication will only use data in anonymous form. This study was cleared by the ethics committee of the University of Essex.

If you experience a technical error or problem, then do not try to restart or retake the study. Rather, send us an email with a description of your problem and we will get back to you. For any question or complaint, please contact Xredacted\_for\_peer\_reviewX (XredactedX@gmail.com). By clicking on “Yes, I consent to participate in the study” you give your consent to take part in the study.

*[Yes, I consent to participate in the study; No, I would not like to participate in the study]*



Do you have an account with Prolific (a platform for online surveys)?

*[Yes; No]*



### Attention screener

The next question is about the following problem. In questionnaires like ours, sometimes there are participants who do not carefully read the questions and just quickly click through the survey. This means that there are a lot of random answers which compromise the results of research studies. To show that you read our questions carefully, please enter 333 as your

answer to the next question. Given the above, what is your favorite number?

*[Number]*



### **Demographics**

What is your age?

*[Dropdown list of possible ages]*

What is your gender?

*[Male; Female; Non-binary]*

In which state do you currently reside?

*[Dropdown list of possible states]*



### **Personal health questions**

Over the last 2 weeks, how often have you been bothered by any of the following problems?

- Little interest or pleasure in doing things
- Feeling down, depressed, or hopeless
- Trouble falling or staying asleep, or sleeping too much
- Feeling tired or having little energy
- Poor appetite or overeating
- Feeling bad about yourself or that you are a failure or have let yourself or your family down
- Trouble concentrating on things, such as reading the newspaper or watching television
- Moving or speaking so slowly that other people could have noticed. Or the opposite being so fidgety restless that you have been moving around a lot more than usual

- Thoughts that you would be better off dead, or of hurting yourself in some way

*[Not at all; Several days; More than half of the days; Nearly every day]*



Over the last 2 weeks, how often have you been bothered by any of the following problems?

- Feeling nervous, anxious or on edge?
- Not being able to stop or control worrying?
- Worrying too much about different things?
- Trouble relaxing?
- Being so restless that it is hard to sit still?
- Becoming easily annoyed or irritable?
- Feeling afraid as if something awful might happen?

*[Not at all; Several days; More than half of the days; Nearly every day]*



The previous questions are commonly used to measure depression. By depression we mean a mental disorder that can be characterized by sadness, a lack of interest and a loss of pleasure, feelings of guilt and low self-esteem, sleep disorders, loss of appetite, tiredness and poor concentration.



We will now ask you a few additional questions about depression.

- Have you ever been diagnosed with depression?
- Have you ever overcome depression?
- Have you ever sought treatment for depression?

*[Yes; No]*

Imagine that you had a depression. What would be the main reasons not to seek depression treatment (select all that apply)?

- ☐ Cannot afford it

- ☐ Afraid others will find out
- ☐ My condition is not too serious
- ☐ Other (please specify)

*[Open text for "Other" option]*

- Are you currently undergoing any form of treatment for depression (e.g. psychological therapy)?
- Would you ever consider taking part in group therapy for depression?

*[Yes; No]*



To what extent do you agree with the following statement?

"People with depression are lazy, hard to be around, and have weak character."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



### **Prior stigma**

In January 2021 we conducted a survey with a sample of 500 Americans. The composition of this sample resembles the American population at large.

What percentage of Americans from this survey would you say agreed or strongly agreed with the following statement?

"People with depression are lazy, hard to be around, and have weak character."

*[Number from 0 to 100]*



## Stigma treatment

You said that you believe that XX% of Americans either agree or strongly agree with the following statement:

"People with depression are lazy, hard to be around, and have weak character."

According to our survey of 500 Americans, the actual share of Americans that either agree or strongly agree with this statement is only XX%.



## Post-treatment stigma beliefs

In November 2020 we conducted another survey with a sample of 300 Americans. The composition of this sample resembles the American population at large.

What percentage of Americans from this survey would you say agreed or strongly agreed with the following statement?

"People with depression are often unreliable, incompetent, and have weak character."

[Number from 0 to 100]



## *redacted-therapy-service-name*

On the next screen we introduce *redacted-therapy-service-name*, one of the leading online group therapy services in the United States. We will then ask you some questions to understand how valuable you find this type of service. This is not promotional material.

Have you ever heard of *redacted-therapy-service-name*?

[Yes; No]



## Public treatment

*redacted-therapy-service-name* *redacted-url* is an online group therapy service. They offer treatment for a wide range of diagnoses and life challenges, including anxiety, depression, and relationship issues, among others.

The service primarily consists of one-hour weekly sessions of group cognitive-behavioral therapy, led by a licensed therapist. An initial consultation allows new subscribers to sort into the group that best suits them.

Each group has at most twelve members that take part in the session via Zoom. As a participant, you can choose how much to interact during the session depending on how much you have to say or how comfortable you feel.

## Private treatment

*redacted-therapy-service-name* *redacted-url* is an online group therapy service. They offer treatment for a wide range of diagnoses and life challenges, including anxiety, depression, and relationship issues, among others.

The service primarily consists of one-hour weekly sessions of group cognitive-behavioral therapy, led by a licensed therapist. An initial consultation allows new subscribers to sort into the group that best suits them.

Each group has at most twelve members that take part in the session via Zoom. As a participant, you can choose how much to interact during the session depending on how much you have to say or how comfortable you feel.

Please note, you can always choose to remain anonymous to the rest of your group on Zoom by using a nickname and by keeping your camera off.



## Willingness to pay

We will now ask you to make a series of choices between receiving different dollar amounts and receiving a voucher for 8 weeks of online therapy from *redacted-therapy-service-name*.

This service is normally priced at \$280 for 8 weeks, but *redacted-therapy-service-name* offers a 50% discount for the first 4 weeks; so that you could buy 8 weeks of therapy on your own for \$210.

After you have made your choices, the computer will randomly select one of your choices and, depending on the selected choice, you will either receive the dollar amount or the voucher for therapy. You will learn which of your choices the computer selected to implement a few moments after you made them. Because each of your choices may count, please make them carefully.

- Would you rather receive \$0 or a voucher for 8 weeks of therapy from *redacted-therapy-service-name*?

[*\$0 - I definitely don't want group therapy; Therapy*]

- Would you rather receive \$10 or a voucher for 8 weeks of therapy from *redacted-therapy-service-name*?
- Would you rather receive \$20 or a voucher for 8 weeks of therapy from *redacted-therapy-service-name*?
- $\vdots$
- Would you rather receive \$300 or a voucher for 8 weeks of therapy from *redacted-therapy-service-name*?

[*Given \$ amount; Therapy*]



### **Auxiliary outcomes**

To what extent do you agree with each of the following statements about yourself?

- I am often unreliable
- I am often incompetent
- My behavior is sometimes unpredictable
- Generally speaking, I have a weak character
- I am often lazy
- I am often hard to be around

[*Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree*]



## Post outcomes

Imagine that you decide to seek treatment in the form of group therapy. How worried would you be about any problems caused by coworkers, friends, or family finding out about your seeking therapy.

*[Not worried at all; Slightly worried; Somewhat worried; Moderately worried; Very worried]*



Imagine that you decide to seek treatment in the form of group therapy. How would you feel about having to interact with your therapist and other group members about your mental health?

*[Very comfortable; Mostly comfortable; Neither comfortable nor uncomfortable; Moderately uncomfortable; Very uncomfortable]*



Imagine that you decide to seek treatment in the form of group therapy. How would you feel about sharing your identity with fellow group members during sessions?

*[Very comfortable; Mostly comfortable; Neither comfortable nor uncomfortable; Moderately uncomfortable; Very uncomfortable]*



To what extent do you agree with the following statement?

"If I were to seek treatment, then that would label me as depressed, which would make me feel worse about myself."

*[Strongly agree; Agree; Neither agree nor disagree; Disagree; Strongly disagree]*



How painful is it for you to think about potential problems with your mental health and what they entail for your life?

*[Very painful; Painful; Slightly painful; Not painful at all]*

# **I Pre-analysis plans**

## **Main Experiment**

We note that we refer to a PHQ8 score of 18 as the cutoff for sample inclusion in the pre-analysis plan, while in the paper we refer to a cutoff of 10. This arises from the fact that we had coded the PHQ8 on a scale from 1 to 4 initially, rather than on a scale from 0 to 3. To make our coding consistent with the predominant convention in psychology we also use a scale from 0 to 3 in the paper. In other words, in the paper we stuck to the pre-registered inclusion criterion, despite the seeming deviation.

# CONFIDENTIAL - FOR PEER-REVIEW ONLY

## Demand for therapy (#107190)

Created: 09/16/2022 09:27 AM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.  
A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

### 1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

### 2) What's the main question being asked or hypothesis being tested in this study?

In this paper, we provide evidence on behavioral frictions that impede the take-up of psychotherapy. Our main research question is the following:  
How do attention allocation and misperceptions casually shape the demand for therapy?

### 3) Describe the key dependent variable(s) specifying how they will be measured.

Our key dependent variable is people's willingness to pay for therapy, elicited using a BDM mechanism.

### 4) How many and which conditions will participants be assigned to?

5 treatment conditions of equal size:

Pure\_control: no elicitation of priors or information provision or elicitation of posteriors before measuring WTP.

Stigma\_flag: elicits beliefs about social stigma

Stigma\_info: elicits beliefs about social stigma and provides information about the actual extent of social stigma associated with depressed people.

Effectiveness\_flag: elicits beliefs about the effectiveness of therapy

Effectiveness\_info: elicits beliefs about the effectiveness of therapy and provides information about the actual effectiveness of stigma as documented by research.

### 5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

We will estimate one reduced form specification, which estimates the effects of the different treatment arms on WTP compared to a pure control group.

$$Y_i = \alpha_0 + \alpha_1 \text{Stigma\_flag}_i + \alpha_2 \text{Stigma\_info}_i + \alpha_3 \text{Effectiveness\_flag}_i + \alpha_4 \text{Effectiveness\_info}_i + \epsilon_i$$

In all of our regressions we will include all control variables that are elicited pre-treatment, such as interest in therapy, the PHQ8 score, gender and willingness to pay for an example good. For all of our analyses, we will use robust standard errors.

To isolate the effects of attention irrespective of information, we will estimate the following specification, using respondents from the pure control group the Stigma\_flag group and the Effectiveness\_flag group:

$$Y_i = \alpha_0 + \alpha_1 \text{Stigma\_flag}_i + \alpha_2 \text{Effectiveness\_flag}_i + \epsilon_i$$

To isolate the effects of information irrespective of attention, we will estimate specifications of the following type (in this case we only use respondents in the Stigma\_flag and Stigma\_info groups):

$$Y_i = \alpha_0 + \alpha_1 \text{belief\_stigma}_i + \alpha_2 \text{Stigma\_info}_i + \alpha_3 \text{belief\_stigma}_i \times \text{Stigma\_info}_i + \epsilon_i$$

where belief\_socialstigma\_i is a continuous measure of prior beliefs about social stigma (we will also estimate this equation with a binary indicator for overestimators/underestimators).

We will estimate similar specifications for respondents in the Effectiveness\_flag and Effectiveness\_info groups:

$$Y_i = \alpha_0 + \alpha_1 \text{belief\_effectiveness}_i + \alpha_2 \text{Effectiveness\_info}_i + \alpha_3 \text{belief\_effectiveness}_i \times \text{Effectiveness\_info}_i + \epsilon_i$$

### 6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

All of our main outcomes are bounded above and below, so we do not need to exclude outliers.

### 7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We plan to recruit 3000 US respondents using the online platform Prolific. We only include respondents with a PHQ8 score above 18. Moreover, we only include respondents that have never tried therapy before. Finally, respondents need to pass a simple attention screener.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

We will collect data on a set of post-treatment questions. We will also elicit the considerations that people have on their mind when deciding on their willingness to pay. This data will consist of a set of dummy variables for different kinds of topics people talk about in both an open-ended answer and a structured measure. These elicitations will be used to shed light on mechanisms.

Finally, a few days after the completion of the survey participants will get a direct message on prolific, in which they are told that there are extra spots available for therapy and that by taking a 3-question survey they qualify for entering a lottery which decides on who gets the therapy. Participation in this survey will be used as a secondary outcome to study the longer term effects of the information treatments.

## CONFIDENTIAL - FOR PEER-REVIEW ONLY

### depression stigma - summer 23 (#137055)

Created: 06/28/2023 08:53 AM (PT)

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A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

#### 1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

#### 2) What's the main question being asked or hypothesis being tested in this study?

We provide evidence on how attention to and information about social stigma associated with depression affects people's emotional well-being and optimism about their mental health.

#### 3) Describe the key dependent variable(s) specifying how they will be measured.

Our key dependent variables are people's agreement or disagreement with the following statements ([5point: strongly agree, agree, neither agree nor disagree, disagree, strongly disagree]):

- Right now, I am feeling down and I don't have the motivation to do anything about it
- Right now, I am feeling fairly good and I don't see the need to do anything about my mental health
- The way others view depressed people keeps me from being optimistic about improving my future mental health by myself.

As secondary outcomes we elicit participant's agreements with the following statements as well

- The way others view depressed people keeps me from seeking help from my social circle when my mental health is not good.
- The way others view depressed people makes me feel that depression is rather common and normal and not something that needs to be treated with therapy.

#### 4) How many and which conditions will participants be assigned to?

3 treatment conditions of equal size:

- Pure\_control: no elicitation of priors or information provision before measuring main outcomes.
- Stigma\_flag: elicits beliefs about social stigma
- Stigma\_info: elicits beliefs about social stigma and provides information about the actual extent of social stigma associated with depressed people.

#### 5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.

We will estimate one reduced form specification, which estimates the effects of the different treatment arms on the outcome of interest relative to a pure control group.

$$Y_i = \alpha_0 + \alpha_1 \text{Stigma\_flag}_i + \alpha_2 \text{Stigma\_info}_i + \epsilon_i$$

In all of our regressions we will include all control variables that are elicited pre-treatment, such as interest in therapy, the PHQ8 score, and gender. For all of our analyses, we will use robust standard errors.

#### 6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.

All of our main outcomes are bounded above and below, so we do not need to exclude outliers.

#### 7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.

We plan to recruit 1000 US respondents using the online platform Prolific. We only include respondents with a PHQ8 score above 18. Moreover, we only include respondents that have never tried therapy before. Finally, respondents need to pass a simple attention screener.

#### 8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)

None

## **CONFIDENTIAL - FOR PEER-REVIEW ONLY**

### **Stigma and the Demand for Group Therapy (#74868)**

Created: 09/16/2021 09:20 AM (PT)

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A non-anonymized version (containing author names) should be made available by the authors when the work it supports is made public.

#### **1) Have any data been collected for this study already?**

No, no data have been collected for this study yet.

#### **2) What's the main question being asked or hypothesis being tested in this study?**

Psychotherapy has been shown to be an effective tool to overcome mental illness, yet a large fraction of the population suffering from mental illness do not seek psychotherapy.

In this paper, we provide evidence on a behavioral friction that impedes the take-up of psychotherapy, the social stigma associated with depression. Our informational treatments allow us to shed light on the role of social stigma associated with depression in decreasing the demand for therapy.

We hypothesize that a simple informational intervention which corrects overly pessimistic misperceptions about high social stigma associated with depression increases people's willingness to pay for therapy and people's actual sign-up for and attendance of therapy sessions.

#### **3) Describe the key dependent variable(s) specifying how they will be measured.**

Our primary main outcome measures are the following:

- + A measure of willingness to pay for therapy elicited using a multiple price list.
- + A dummy taking value one for respondents who attend any therapy session with group

The secondary outcome measures are:

- + A dummy taking value one for respondents who sign up to receive therapy with group
- + The number of therapy sessions our respondents attend. This will be coded zero for respondents who never signed up for therapy to begin with.

#### **4) How many and which conditions will participants be assigned to?**

Treatment 1: No information

Treatment 2: Information about low stigma associated with depression.

We also cross-randomize whether we inform participants about the possibility to remain anonymous during the therapy sessions by keeping the camera turned off and by using a nickname.

#### **5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

We will run OLS regressions of our main outcomes on dummies for the different treatment groups. In our main specifications, we will look at the effect of the information treatment by regressing the outcomes on a dummy for whether the respondent was randomly assigned to receive the information treatment. In our other main specifications, we will study how 'making it salient' that it is possible to remain anonymous during sessions interacts with the treatment. To do so, we regress our outcomes on a dummy for the information treatment, a dummy for having received instructions that make it salient that one can remain anonymous, and the interaction of these two dummy variables.

In all of our regressions, we will include a series of control variables in our regressions, such as interest in therapy, the PHQ8 score, gender, dummies for reasons not to take up therapy (elicited pre-treatment), prior beliefs about stigma associated with depression (coded as a continuous variable), and prior history of depression.

#### **6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

There will be no outliers in our survey data as all variables are bounded above. Some outcomes are binary; others come from willingness to pay elicitation. The number of therapy sessions attended is also bounded above by the maximum number of therapy sessions available with Group.

#### **7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

We only include respondents with a PHQ8 score above 18 and those who have pessimistic beliefs about others' views on depressed people (i.e. respondents who overestimate the extent of stigma associated with depression relative to what society actually thinks). We focus on respondents who overestimate the extent of stigma associated with depression relative to what society actually thinks for ethical reasons, to avoid making depressed individuals more pessimistic about the stigma associated with depression.

We aim to achieve a sample size of 2,000-3000 respondents, in order to have at least 200 depressed people who enroll into therapy.

Our respondents will be recruited primarily in New York State using Prolific and Dynata as most of Grouport's therapists have licenses to practice therapy sessions in New York State. In case we fail to recruit sufficiently many respondents in New York State, we may recruit participants from New Jersey.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

We also collect a set of post-treatment questions that we will use to shed light on mechanisms.

# CONFIDENTIAL - FOR PEER-REVIEW ONLY

## Perceived depression stigma: validation and robustness (#184021)

Created: 07/23/2024 07:33 AM (PT)

This is an anonymized copy (without author names) of the pre-registration. It was created by the author(s) to use during peer-review.  
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### 1) Have any data been collected for this study already?

No, no data have been collected for this study yet.

### 2) What's the main question being asked or hypothesis being tested in this study?

This survey offers a validation of a measure of perceived depression stigma that we have developed in previous work.

Our main hypothesis is that, among depressed people that have never sought therapy, our measure of perceived depression stigma correlates strongly with the more established measure of perceived depression stigma - which is a 9-items inventory proposed by Griffiths et al 2004.

As secondary hypotheses, we are interested in

- Studying whether the correlation between our measure of perceived depression stigma and the one proposed in Griffiths et al 2004 holds more broadly in a representative sample of the US population.
- Whether our measure of perceived depression stigma correlates with a hypothetical demand for online and in-person therapy in depressed individuals. We will study this question separately for people that have experienced therapy before and for people that have not.
- How our measure of perceived depression stigma differs by depression status; comparing depressed individuals to non-depressed individuals.

Griffiths, Kathleen M., Helen Christensen, Anthony F. Jorm, Kimberley Evans, and Chloe Groves. "Effect of web-based depression literacy and cognitive-behavioural therapy interventions on stigmatising attitudes to depression: Randomised controlled trial." *The British Journal of Psychiatry* 185, no. 4 (2004): 342-349.

### 3) Describe the key dependent variable(s) specifying how they will be measured.

Our main measure of perceived depression stigma is the answer to a quantitative survey question of what the respondent believes is the share of Americans who agree or strongly agree with the statement that "people with depression are lazy, hard to be around, and have weak character".

The more established measure of perceived depression stigma is a scale based on the following questions. For the resulting outcome, larger values indicate greater perceived stigma.

To what extent do you agree with each of the following statements?

[strongly disagree/disagree/neither agree nor disagree/agree/strongly agree]

- Most people believe that people with depression could snap out of it if they wanted
- Most people believe that depression is a sign of personal weakness
- Most people believe that depression is not a real medical illness
- Most people believe that people with depression are dangerous
- Most people believe that it is best to avoid people with depression so you don't become depressed yourself
- Most people believe that people with depression are unpredictable
- If they had depression, most people would not tell anyone
- Most people would not employ someone they knew has been depressed
- Most people would not vote for a politician they knew had been depressed

Finally, we collect a hypothetical willingness to enroll in individual therapy in the next month. For this measure, we vary experimentally whether respondents are asked about online or in-person therapy.

### 4) How many and which conditions will participants be assigned to?

We conduct the survey in two separate samples. One with a representative sample of the US population (based on sex, age and ethnicity), and one with a sample that includes only depressed people (with a PHQ8 score  $\geq 10$ ).

Within the survey of depressed individuals, we randomize whether the hypothetical outcome is about in-person individual therapy or online individual therapy.

**5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.**

We test our main hypothesis by estimating the pair-wise correlation between our measure of perceived depression stigma and the one proposed by Griffiths et al 2004, in the fraction of our depressed sample that has never undergone therapy before.

We will then re-estimate this pair-wise correlation, in the representative sample of the US population.

We will estimate the pair-wise correlation between our measure of perceived stigma and the hypothetical demand for online [in-person] therapy, separately for partitions of the depressed sample that have experienced therapy before and for those that have not.

We will estimate, in the representative sample, an OLS model regressing perceived depression stigma on depression status (i.e. whether the subject has a PHQ8  $\geq 10$ ).

For all analyses we will employ standard two-sided t-tests.

**6) Describe exactly how outliers will be defined and handled, and your precise rule(s) for excluding observations.**

The surveys will be run on Prolific. We will exclude participants who are unable to pass an attention check.

**7) How many observations will be collected or what will determine sample size? No need to justify decision, but be precise about exactly how the number will be determined.**

We aim to recruit 1000 participants for the representative sample and 1000 participants for the depressed sample (PHQ-8  $\geq 10$ ). In the latter, we randomize with equal probability whether the hypothetical outcome is about in-person individual therapy or online individual therapy.

**8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)**

We will also collect a Personal Depression Stigma 9-items inventory for exploratory purposes.

We will also ask respondents for a version of their hypothetical demand for individual therapy that abstracts from cost considerations.