Online Appendix: Misperceived effectiveness and the demand for psychotherapy[1]

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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) *Control*	(5) *Flag*	(6) *Info*	(7) p-value (2)-(3)	(8) p-value (4)-(5)-(6)
Age	49.568	49.604	30.473	30.550	30.466	30.404	0.000	0.624
	(0.259)	(0.846)	(0.233)	(0.422)	(0.383)	(0.407)		
Female	0.511	0.616	0.559	0.566	0.546	0.565	0.030	0.720
	(0.007)	(0.023)	(0.012)	(0.020)	(0.020)	(0.020)		
PHQ8 Score	3.188	13.575	13.964	14.148	13.941	13.801	0.054	0.370
	(0.058)	(0.157)	(0.083)	(0.150)	(0.142)	(0.140)		
Heard of BetterHelp			0.545	0.520	0.559	0.557		0.313
			(0.012)	(0.020)	(0.020)	(0.020)		
Insurance Covers Therapy			0.468	0.474	0.472	0.458		0.844
			(0.012)	(0.021)	(0.021)	(0.021)		
Prior Effectiveness Belief					16.459	16.365		0.683
					(0.146)	(0.146)		
Observations	5068	445	1843	615	614	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 1,720 observations (574, 572, 574 in *Pure control*, *Flag*, and *Info* conditions, respectively).

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Table A.2: External Validity

	Subgroup				K-S test p-value	
Effectiveness belief measure	(1) Depressed	(2) Depressed and experienced	(3) Depressed and inexperienced	(4) Non-depressed	(5) (2) = (3)	(6) (1) = (4)
Primary	56.148	54.980	57.216	59.929	0.587	0.000
	(19.831)	(19.715)	(19.936)	(19.653)		
Secondary	15.348	15.676	15.049	16.055	0.599	0.020
	(4.300)	(4.198)	(4.383)	(4.142)		
N	310	148	162	813		

Notes: This table reports the results of an additional pre-registered survey that examined whether depressed individuals are particularly pessimistic in their beliefs on the effectiveness of therapy. We report for each variable the mean and standard deviation in parantheses for four subgroups - depressed individuals, depressed individuals with previous therapy experience, depressed individuals without previous therapy experience, and non-depressed individuals. The primary belief question is *"The largest of these studies was conducted in 2008 and included 818 participants that were diagnosed with depression. What percentage of study participants assigned to take part in psychotherapy do you think recovered from depression?"*, elicited on a percentage chance scale from 0 to 100. The secondary belief question is *"Researchers have conducted many clinical studies to estimate the effectiveness of psychotherapy for treating depression. A comprehensive review looked at the 22 studies with the largest number of participants. Out of these 22 studies, how many do you think show that therapy is an effective treatment for depression?"*, elicited on a discrete scale from 0 to 22. Kolmogorov-Smirnov tests reveal that depressed individuals who have previous therapy experience have similar effectiveness beliefs to depressed individuals who have not tried therapy (Column 5), and that depressed individuals are more pessimistic about the effectiveness of therapy than non-depressed individuals (Column 6).

Table A.3: Handcoding scheme of open-ended data

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."

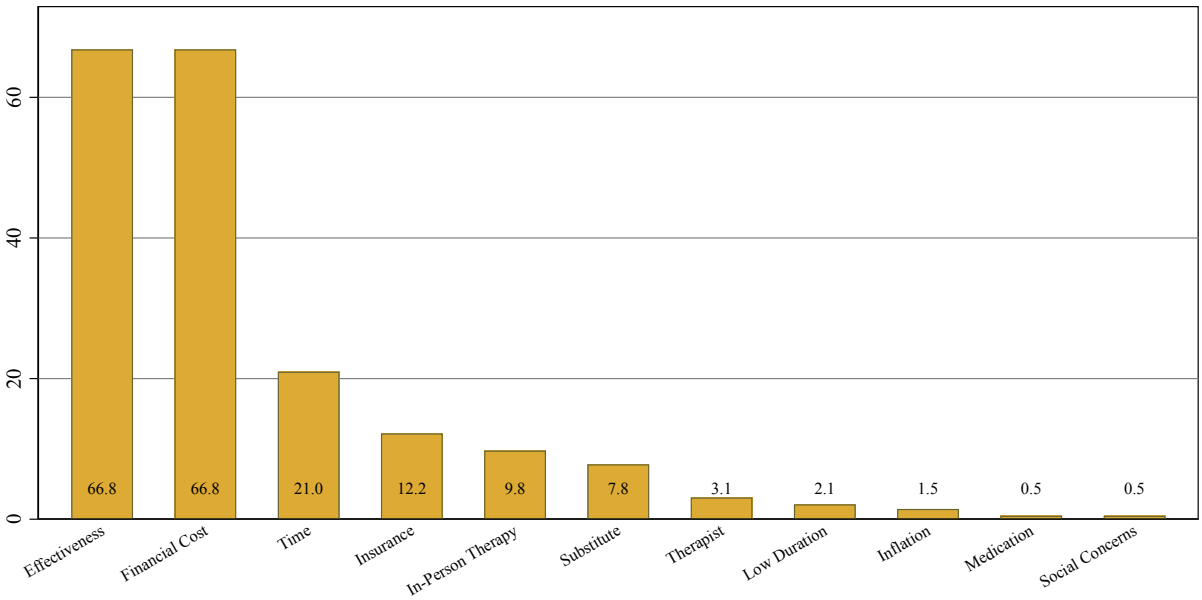

Figure A.1: Top of mind considerations that affect therapy demand

Notes: The bars represent the fractions of respondents in the *Pure control* group (615 observations) who mentioned a given category in their written responses regarding their considerations while deciding on their willingness to pay for BetterHelp. Online Appendix Figure A.2 broadly confirms these patterns using our structured measure of considerations. Taken together, these data underscore the importance of concerns about therapy effectiveness.

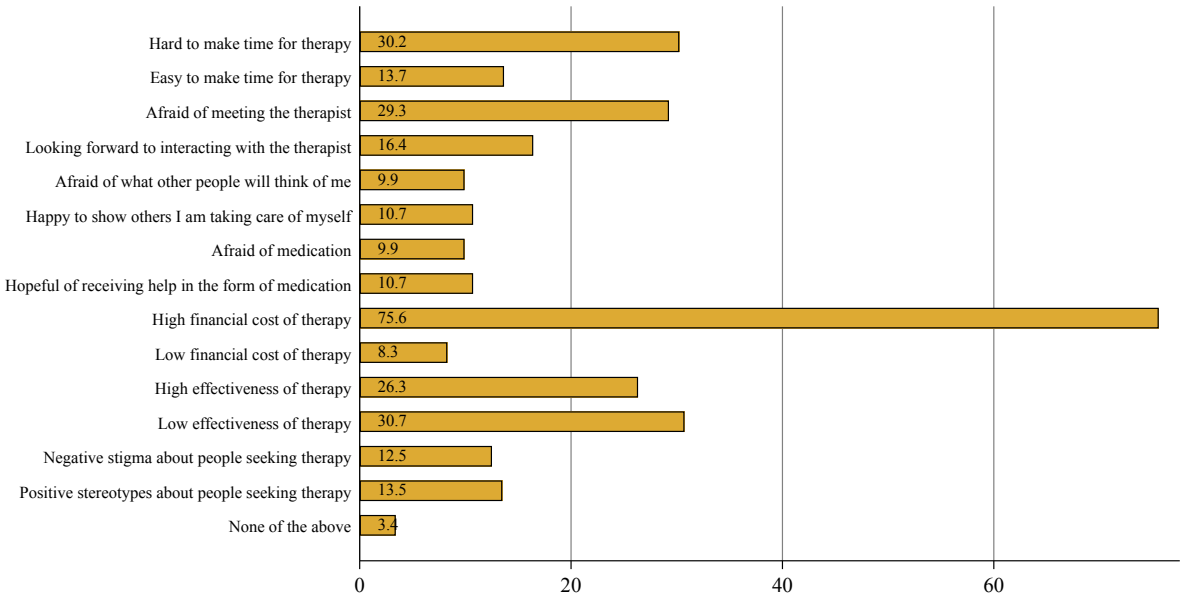

Figure A.2: This Figure displays data from *Pure control* respondents.

Notes: The bars represent the fractions of respondents (615 observations) who select each of the considerations above, in a structured multiple-choice question, as having influenced their decision for the willingness to pay for therapy.

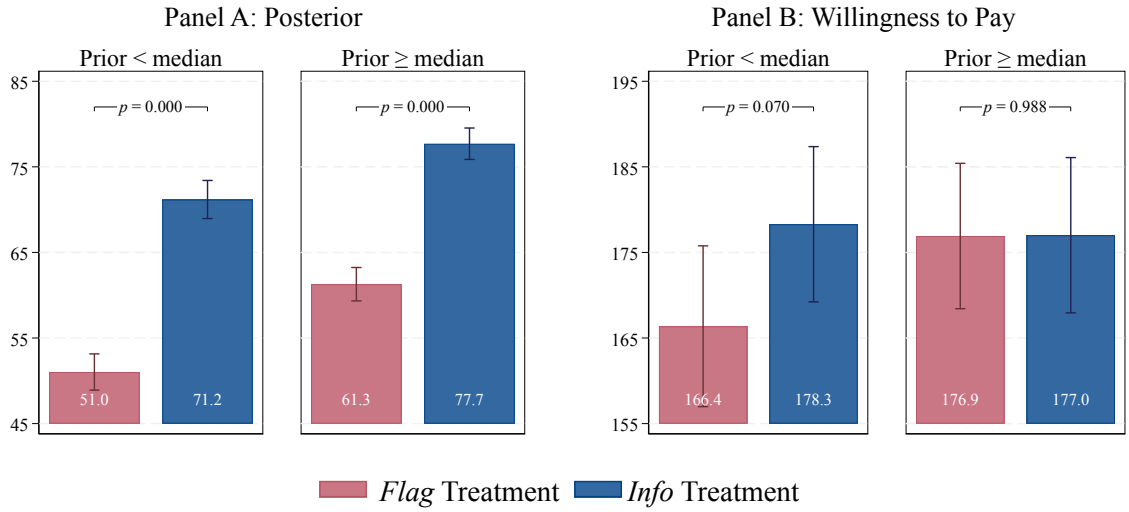

Figure A.3: Heterogeneous treatment effects on posterior beliefs and willingness to pay

Notes: This figure presents predicted values derived from regression analyses incorporating an interaction term based on pre-treatment beliefs about the effectiveness of psychotherapy. Panel A focuses on post-treatment quantitative beliefs in the effectiveness of psychotherapy; the control variables used in the regressions include age, gender, the PHQ8 score, and an indicator for previous consideration of individual online therapy for depression. Panel B reports the willingness to pay for BetterHelp; the control variables used in the regressions include age, gender, 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. In both panels, the left-hand side displays results for groups with pre-treatment beliefs below (and on the right-hand side, above or equal to) the median of 17. 95 percent confidence intervals and p-values are computed using robust standard errors from relevant regressions (reported in columns 2 and 4 of Online Appendix Table A.4).

Table A.4: Heterogeneity of *Info* treatment effect by priors about effectiveness

	(1) Posterior	(2) Posterior	(3) WTP	(4) WTP
Info	29.49***	20.15***	42.90*	11.92*
	(5.598)	(1.550)	(21.88)	(6.572)
Prior (continuous)	1.797***		2.511***	
	(0.223)		(0.900)	
Info×Prior (continuous)	-0.699**		-2.276*	
	(0.331)		(1.306)	
Prior ≥ median		10.26***		10.54
		(1.461)		(6.431)
Info×Prior ≥ median		-3.738*		-11.83
		(2.054)		(9.080)
Constant	28.03***	51.88***	40.70**	75.62***
	(4.731)	(2.981)	(19.66)	(13.74)
Controls	Yes	Yes	Yes	Yes
Observations	1228	1228	1228	1228
R^2	0.267	0.242	0.290	0.287

Notes: The dependent variable in columns 1 and 2 is the post-treatment quantitative beliefs in the effectiveness of psychotherapy, and control variables used in the regressions include age, gender, the PHQ8 score, and an indicator for previous consideration of individual online therapy for depression. Columns 3 and 4 focus on the willingness to pay for BetterHelp; the control variables used in the regressions include age, gender, 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. Columns 1 and 3 (2 and 4) use the continuous (binary) measure of pre-treatment quantitative beliefs in the effectiveness of psychotherapy. Robust standard errors in parantheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

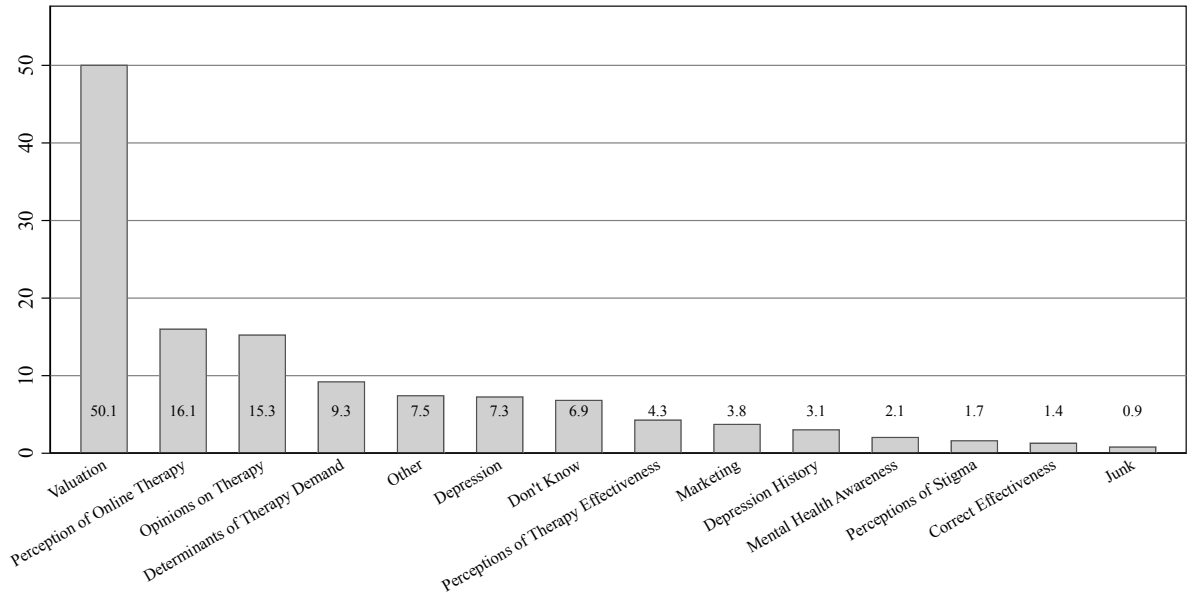

Figure A.4: This Figure displays data from all respondents.

Notes: The bars represent the fractions of respondents (1843 observations) who mentioned a given category in their written responses when asked what they thought the study is about.

Table A.5: Handcoding scheme of open-ended data on the perceived aim of the study

Category	**Description**	**Example Responses**
Correct Effectiveness	State that survey tried to measure how perceptions of therapy effectiveness in the experiment affect valuation	"How willing people would be to pay for a therapy service when exposed to information regarding its effectiveness."
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."

B Welfare analysis

In this appendix we discuss the welfare implications of subsidizing therapy and of providing accurate information about its effectiveness for first-time therapy users. To this end, we compute the Marginal Value of Public Funds (MVPF), proposed by Hendren and Sprung-Keyser (2020), of different combinations of subsidy and information policy interventions. The MVPF is defined as follows:

$$\text{MVPF} = \frac{\text{Benefits}}{\text{Net Govt Cost}} = \frac{\Delta W}{\Delta E - \Delta C}$$

where ΔW represents the benefit of a given intervention, ΔE the upfront expenditure, and ΔC the long-run reduction in government costs that result from the intervention.

We use the demand curves we uncover in our experiment to calculate demand under different subsidy and information regimes. In particular, we assume that the share of individuals who take up therapy under subsidy X without information equals the share of individuals whose willingness to pay for therapy is strictly greater than $320 - X$ in the *Pure control* condition. In the presence of information, this share corresponds to the share of individuals with a willingness to pay greater than $320 - X$ in the *Info* condition. We denote the distribution of willingness to pay for the *Pure control* and *Info* conditions by F_{WTP} and G_{WTP} respectively.

We study three policy regimes that feature either only subsidies, only information (taking the subsidy as given), or a combination of subsidy and information. Compliers are those individuals who demand therapy as the direct result of a given policy. Compliers' private

benefit of receiving therapy is given by WTP_s, WTP_i, and WTP_{s+i}, where the subscripts refer to subsidy, information, and subsidy and information policies respectively.

We will consider the case of a positive externality associated with therapy that equals $\epsilon \times \text{WTP}$. Externalities might include benefits to employers from increased productivity[2] or the improved well-being of friends and family.

We also consider the case where a share τ of the pre-tax benefits of seeking therapy, accruing both to the individual and via the externality, can be collected in taxes. This is the case if much of the benefits of seeking therapy manifest in terms of productivity gains.

Policy 1: Subsidies only

For a subsidy level of X, we compute $\Delta W(X)$ as the sum of two terms.

$$\Delta W_s(X) = [F_{WTP}(320) - F_{WTP}(320 - X)] \times [(1 + \epsilon) \times \text{WTP}_s - 320\$] +$$
$$+ [1 - F_{WTP}(320 - X)] \times X\$$$

The first term is the total post-tax benefit of therapy take-up net of the cost of therapy, multiplied by the share of individuals who take up therapy only when a subsidy is provided, i.e. the rate of compliance. The second term is the value of the subsidy, multiplied by the share of individuals who would have taken up therapy even without any subsidy.

We calculate $\Delta E(X)$ as the subsidy amount multiplied by the share of all individuals who

[2]According to Greenberg et al. (2021), a sizable share of the economic costs of depression are borne by employers, with estimates ranging from 48% to 61%.

take up therapy under a given subsidy level:

$$\Delta E_s(X) = [1 - F_{WTP}(320 - X)] \times X\$$

Finally, we compute $\Delta C(X)$ as the total increase in taxes due to a therapy take-up, multiplied by the share of subsidy compliers:

$$\Delta C_s(X) = \frac{\tau}{1-\tau} \times [F_{WTP}(320) - F_{WTP}(320 - X)] \times (1 + \epsilon) \times \text{WTP}_s$$

A key term in the expressions for $\Delta W(X)$ and $\Delta C(X)$ is the private benefit of seeking therapy among compliers WTP_s. It is computed as follows:

$$\text{WTP}_s(X) = \mathbb{E}[w | 320 - X < w \leq 320, \textit{Pure Control}] + \beta_{\textit{Info}}$$

We take the mean of the elicited willingness to pay for the *Pure control* group, conditional on it being above the subsidized cost and below the raw cost (i.e. conditional on being among the group of compliers for a given level of subsidy). We then adjust for the fact that the subsidy corrects for the negative internality of being misinformed about the effectiveness of therapy by adding the term $\beta_{\textit{Info}}$. This term is the coefficient of an OLS regression that estimates the effect of *Info* on willingness to pay relative to the *Pure control*.

Implicit in the above calculations is the assumption that participants decide on whether they purchase therapy based on their uninformed willingness to pay, but that the value they receive from therapy is reflected in their informed willingness to pay. Moreover, we assume that individuals' only bias in assessing the private value of therapy lies in their

underestimation of the effectiveness of therapy.

Table B.1 presents the MVPF of different subsidy levels conditional on the externality $\epsilon = \{0\%, 50\%\}$ and the tax on the benefits of therapy $\tau = \{0\%, 20\%\}$. Moving from the left to the right in a given row of table B.1, we make the observation that the MVPF is higher, and a policy more efficient, if the externality ϵ is bigger and if more of the benefits of therapy are taxable τ because, for example, they take the form of increases in human capital.

Table B.1: Welfare Analysis, subsidies only

	(1)	(2)	(3)	(4)	(5)	(6)
	Data		MVPF			
Subsidy	% Takers	WTP	$\epsilon = 0\%$ $\tau = 0\%$	$\epsilon = 50\%$ $\tau = 0\%$	$\epsilon = 0\%$ $\tau = 20\%$	$\epsilon = 50\%$ $\tau = 20\%$
20	0.099	322.7	1.067	5.036	∞	∞
70	0.182	304.4	0.839	2.411	3.924	∞
120	0.312	274.7	0.683	1.643	1.313	5.862
170	0.499	242.7	0.591	1.233	0.871	2.377
220	0.647	218.2	0.573	1.030	0.743	1.568
270	0.842	189.1	0.544	0.874	0.652	1.160
320	0.972	168.3	0.550	0.800	0.629	0.984

Notes: % Takers denotes $1 - F_{WTP}(320 - X)$. We assume that the positive externality of the therapy (ϵ) is equal to 0% or 50% of this amount, and that 0% or 20% of pre-tax benefit is collected as taxes (τ). We set the cost of therapy at 320\$. MVPF = ∞ indicates that the tax gains due to the policy exceed the upfront expenditure, which Hendren and Sprung-Keyser (2020) interpret as a Pareto improvement.

Going down the rows we see that larger subsidies are less likely to be welfare-improving. In fact, in the case of $\epsilon = 0$ and $\tau = 0$, all MVPFs for subsidies greater than 20 are below 1, which implies that such policies are inefficient. This is because the larger the subsidy, the more of the individuals that select into therapy have a private and social value of therapy that is smaller than the cost of providing therapy. This misallocation then also dominates the positive effect of intermediate subsidies that stems from correcting the informational internality that is the topic of this paper.

Table B.2: Effect of *Info* on demand for therapy at different subsidy levels

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Subsidy:	20 $	70 $	120 $	170 $	220 $	270 $	320 $
Info	-0.00275	0.0171	0.0375	0.0681***	0.0584**	0.00700	-0.00434
	(0.0162)	(0.0208)	(0.0246)	(0.0256)	(0.0243)	(0.0190)	(0.00934)
Pure control mean	0.10	0.18	0.31	0.50	0.65	0.84	0.97
Observations	1229	1229	1229	1229	1229	1229	1229
R^2	0.124	0.169	0.179	0.201	0.178	0.135	0.041

Notes: Dependent variables are the indicators for having willingness to pay above $320 - X$, where X is the subsidy level. The control variables used in the regressions include age, gender, 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. Robust standard errors in parentheses, * p<0.1, ** p<0.05, *** p<0.01.

Policy 2: Information only

Next, we compute the MVPF for the *Info* intervention when subsidies are already in place. We use the demand schedules of the *Pure control* and *Info* treatments to identify the compliers of the information treatment at each subsidy level. More specifically, for every subsidy level X, we use an OLS regression to estimate ζ_X as the effect of being in the *Info* rather than *Pure control* condition on whether a participant has a willingness to pay above $320 - X$.[3] Table B.2 reports the effect of the *Info* treatment on demand for therapy at different subsidy levels and therefore contains our estimates of ζ_X.

We assume a cost c of the information intervention. We do not weight this cost by the share of *Info* compliers, to capture the fact that the *Info* treatment would incur costs even for those who do not take up therapy. The terms of the MVPF can then be written as follows.

$$\Delta W_i(X) = \zeta_X \times [(1+\epsilon) \times \text{WTP}_i - 320\$ + X\$]$$

$$\Delta E_i(X) = \zeta_X \times X\$ + c$$

$$\Delta C_i(X) = \frac{\tau}{1-\tau} \times \zeta_X \times (1+\epsilon) \times \text{WTP}_i$$

We compute WTP_i as the mean of elicited willingness to pay for the ζ_X percent of the *Info*

[3] If this effect is negative, we set ζ_X to 0.

treatment group with the lowest elicited willingness to pay, conditional on it being above the subsidized cost. This means that we make the conservative assumption that compliers of the *Info* treatment are those with the lowest willingness to pay among the buyers of therapy.

$$\text{WTP}_i(X) = \mathbb{E}[w|320 - X < w, \text{lowest } \zeta_X \text{ \%}, \textit{Info}]$$

Table B.3 presents the MVPF conditional on externality $\epsilon = \{0\%, 50\%\}$, tax rate $\tau = \{0\%, 20\%\}$, and costs of the information campaign $c = \{1\$, 5\$\}$ per depressed person. We see that information policies are only efficient in the presence of moderate subsidies like \$70 or \$120, and only when the cost of information provision is small and therapy is associated with a positive externality or increased tax revenue.

Table B.3: Welfare Analysis, information treatment only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Data		MVPF, c = 1\$				MVPF, c = 5\$			
Subsidy	% Comp	WTP	$\epsilon = 0\%$ $\tau = 0\%$	$\epsilon = 50\%$ $\tau = 0\%$	$\epsilon = 0\%$ $\tau = 20\%$	$\epsilon = 50\%$ $\tau = 20\%$	$\epsilon = 0\%$ $\tau = 0\%$	$\epsilon = 50\%$ $\tau = 0\%$	$\epsilon = 0\%$ $\tau = 20\%$	$\epsilon = 50\%$ $\tau = 20\%$
20	0	301.0	0	0	0	0	0	0	0	0
70	0.017	253.8	0.030	1.017	0.059	3.920	0.011	0.360	0.013	0.489
120	0.037	204.2	0.029	0.725	0.044	1.518	0.017	0.420	0.021	0.602
170	0.068	167.7	0.096	0.550	0.124	0.834	0.073	0.417	0.088	0.562
220	0.058	120.7	0.087	0.342	0.100	0.423	0.068	0.265	0.075	0.311
270	0.007	54.4	0.011	0.077	0.011	0.081	0.004	0.032	0.005	0.033
320	0	1.0	0	0	0	0	0	0	0	0

Notes: % Comp denotes ζ_X. We assume that the positive externality of the therapy (ϵ) is equal to 0% or 50% of this amount, and that 0% or 20% of pre-tax benefit is collected as taxes (τ). We set the cost of information intervention (c) at 1\$ or 5\$ per depressed individual (including those who do not take up any therapy). We set the cost of therapy at 320\$. MVPF = ∞ indicates that the tax gains due to the policy exceed the upfront expenditure, which Hendren and Sprung-Keyser (2020) interpret as a Pareto improvement.

Policy 3: Combined policy

We now turn to the MVPF of a policy that features subsidies and information. The previous analysis took subsidies as given and asked about the efficiency of an information interven-

tion conditional on a given subsidy or partial insurance cover. As a result, this analysis ignored how the presence of an information intervention may affect the value associated with subsidies. The following analysis studies the combined effect of introducing subsidies and information and can therefore account for complementarities, runnning both ways, between the two policies.

Calculations for the combined policy are quite similar to the calculations for the subsidies only treatment, with two notable differences. First, we focus on the individuals who take up therapy at subsidy level X under the *Info* treatment, which is given by the elicited willingness to pay for the *Info* condition. Second, we add a c as the cost of the information intervention.[4]

$$\begin{aligned}
\Delta W_{s+i}(X) &= [F_{WTP}(320) - G_{WTP}(320 - X)] \times [(1+\epsilon) \times \text{WTP}_{s+i} - \$320] + \\
&\quad + [1 - G_{WTP}(320 - X)] \times \$X \\
\Delta E_{s+i}(X) &= [1 - G_{WTP}(320 - X)] \times \$X + c \\
\Delta C_{s+i}(X) &= \frac{\tau}{1-\tau} \times [F_{WTP}(320) - G_{WTP}(320 - X)] \times (1+\epsilon) \times \text{WTP}_{s+i}
\end{aligned}$$

We compute WTP_{s+i} as the the mean of elicited willingness to pay for the *Info* treatment group, conditional on it being above the subsidized cost and below the raw cost (i.e. conditional on being a complier for a given level of subsidy).

$$\text{WTP}_{s+i}(X) = \mathbb{E}[w | 320 - X < w \leq 320, \textit{Info}]$$

Table B.4 presents the MVPF for the combined policy. Unlike in the case of only subsidies,

[4]We do not weight this cost by the share of *Info* compliers, to capture the fact that the information intervention would incur costs even for those who do not take up therapy.

the MVPF is not monotonically decreasing in the level of subsidies, but can sometimes be highest for intermediate values of the subsidy. This is the result of information being most valuable at these subsidy levels.

Table B.4: Welfare Analysis, information treatment + subsidies

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Data		MVPF, c = 1$				MVPF, c = 5$			
Subsidy	% Takers	WTP	$\epsilon = 0\%$ $\tau = 0\%$	$\epsilon = 50\%$ $\tau = 0\%$	$\epsilon = 0\%$ $\tau = 20\%$	$\epsilon = 50\%$ $\tau = 20\%$	$\epsilon = 0\%$ $\tau = 0\%$	$\epsilon = 50\%$ $\tau = 0\%$	$\epsilon = 0\%$ $\tau = 20\%$	$\epsilon = 50\%$ $\tau = 20\%$
20	0.101	312.4	0.542	3.158	∞	∞	0.233	1.359	0.533	8.711
70	0.208	292.6	0.658	2.140	2.543	∞	0.523	1.703	1.277	14.820
120	0.360	263.7	0.583	1.507	1.084	4.904	0.535	1.382	0.928	3.788
170	0.580	233.1	0.528	1.148	0.765	2.145	0.508	1.104	0.723	1.995
220	0.717	213.5	0.547	0.995	0.704	1.499	0.533	0.970	0.682	1.444
270	0.862	191.8	0.550	0.883	0.660	1.177	0.541	0.868	0.647	1.151
320	0.971	173.3	0.563	0.819	0.646	1.014	0.556	0.809	0.637	0.998

Notes: % Takers denotes $1 - G_{WTP}(320 - X)$. We assume that the positive externality of the therapy (ϵ) is equal to 0% or 50% of this amount, and that 0% or 20% of pre-tax benefit is collected as taxes (τ). We set the cost of information intervention (c) at 1$ or 5$ per depressed individual (including those who do not take up any therapy). We set the cost of therapy at 320$. MVPF = ∞ indicates that the tax gains due to the policy exceed the upfront expenditure, which Hendren and Sprung-Keyser (2020) interpret as a Pareto improvement.

C Instructions

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 Egon Tripodi (egontrpd@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 of 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

Which of the following statements are TRUE? Please tick all that apply.

- ☐ 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 effectiveness

Researchers have conducted many clinical studies to estimate the effectiveness of psychotherapy for treating depression. A comprehensive review looked at the 22 studies with the largest number of participants.

$ Out of these 22 studies, how many do you think show that therapy is an effective treatment for depression?

[Number out of 22]

Here is a related question. How likely is it that the majority of these studies show that therapy is an effective treatment for depression?

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

FLAG

You said that you believe that X out of 22 studies find psychotherapy to be effective. At the end of this study we will send you the correct answer to this question as a private message on Prolific.

Effectiveness treatment

You said that you believe that X out of 22 studies find psychotherapy to be effective. On this page you will find out the correct answer to this question. The review from Pim Cuijpers and co-authors shows that out of the 22 clinical studies with at least a hundred participants, all 22 studies find that therapy is an effective treatment for depression.

Posterior effectiveness

$ The largest of these studies was conducted in 2008 and included 818 participants that were diagnosed with depression. What percentage of study participants assigned to take part in psychotherapy do you think recovered from depression?

My estimate is __

[Slider from 0 to 100]

How likely do you think it is that completing therapy would be effective for you in overcoming 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 BetterHelp 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]

D Pre-analysis plan

This pre-registration features a second experiment that we conducted at the same time as the effectiveness experiment and that featured two separate treatment conditions with different samples. The second experiment aimed to measure and debias beliefs about the social stigma associated with depression and is featured in Roth et al. (2024) alongside two further separately pre-registered experiments that explore stigma.

We also conducted a separate data collection to better understand the broader prevalence of pessimism around psychotherapy effectiveness, which is described in the second pre-registration below.

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Demand for therapy (#107190)

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

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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?
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 Stigma_flag_i + \alpha_2 Stigma_info_i + \alpha_3 Effectiveness_flag_i + \alpha_4 Effectiveness_info_i + \varepsilon_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 Stigma_flag_i + \alpha_2 Effectiveness_flag_i + \varepsilon_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 belief_stigma_i + \alpha_2 Stigma_info_i + \alpha_3 belief_stigma_i x Stigma_info_i + \varepsilon_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 belief_effectiveness_i + \alpha_2 Effectiveness_info_i + \alpha_3 belief_effectiveness_i x Effectiveness_info_i + \varepsilon_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.

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Broader prevalence of pessimism around psychotherapy effectiveness. (#189189)

Created: 09/07/2024 04:18 AM (PT)

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 serves to assess how pessimism about the effectiveness of psychotherapy differs among depressed people, depending on whether they experienced therapy before or not.

3) Describe the key dependent variable(s) specifying how they will be measured.
We have two incentivized belief measures of psychotherapy effectiveness.

Our primary measure for this survey is based on a survey question on what is the fraction of subjects, from a particular study, who recovered from depression when assigned to a cycle of psychotherapy.

Our secondary measure is based on a survey question on what is the number of studies from a particular meta-analysis that find psychotherapy to be an effective treatment for depression.

4) How many and which conditions will participants be assigned to?
We split our sample of depressed people (PHQ8 score >= 10) into people who have attended psychological therapy for depression (HAVES) vs. those who have not (HAVENOTS).

5) Specify exactly which analyses you will conduct to examine the main question/hypothesis.
We will compare the distributions of effectiveness beliefs between HAVES and HAVENOTS.
For all analyses we will report Kolmogorov – Smirnov tests of the equality of distributions.

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 300 depressed participants (PHQ-8>=10).

8) Anything else you would like to pre-register? (e.g., secondary analyses, variables collected for exploratory purposes, unusual analyses planned?)
We will measure effectiveness beliefs among non-depressed survey participants, to further explore the prevalence of pessimism around psychotherapy effectiveness.

Appendix References

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