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Gains, Losses, and Effort as Predictors of Seeking Psychotherapy for Depression

by

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Gains, Losses, and Effort as Predictors of Seeking Psychotherapy for Depression

Dissertation Abstract—Idaho State University (2022)

Depression is a common mental health concern, and psychotherapy has been shown to effectively treat depression. However, many individuals with depression do not seek psychotherapy. The current study used a behavioral economic model to predict psychotherapy use among individuals with depression. Non-treatment-seeking participants ($N = 253$) with moderate-severe depression symptoms reported their symptom severity, the positive and negative consequences they anticipated from psychotherapy (i.e., gains and losses), the amount of effort they anticipated seeking psychotherapy would require, and their behavioral sensitivity to gains, losses, and effort (i.e., effort discounting). They also reported their help-seeking behavior and intentions at a 3-month follow-up. Depression symptom severity was associated with higher anticipated losses of psychotherapy at baseline, such as concerns about feeling embarrassed or receiving a serious diagnosis. In turn, losses negatively predicted help-seeking intentions and psychotherapy use during the follow-up period. Anticipated gains of psychotherapy, such as getting useful advice or feeling better, did not predict psychotherapy use. However, gains and sensitivity to gains interacted to predict help-seeking intentions: gains had a positive effect on intentions among those with high sensitivity to gains but a negative effect for those with low sensitivity to gains. Effort and effort discounting also interacted to predict intentions, but only among those who responded systematically on the effort discounting measure. This suggests that help-seeking interventions for individuals with depression may be most effective by reducing the perceived losses of psychotherapy. Effects of modifying the gains and effort of psychotherapy may differ depending on sensitivity to these factors.

Key Words: help-seeking, psychotherapy, depression, behavioral economics, discounting

Chapter 1: Introduction

Approximately 20% of adults in the United States experience a depressive disorder at some point in their lives (Hasin et al., 2018). Although psychotherapy has been recognized as a first-line treatment for depression (Kamenov et al., 2017), few seek it when needed (Mojtabai & Olfson, 2006). In addition, ongoing efforts to identify those at risk of going untreated and increase help-seeking have had limited success among individuals with depression (Gulliver et al., 2012; Siegel et al., 2016). One reason for this lack of success may be that the majority of past help-seeking research has not accounted for the behavioral characteristics of depression that affect help-seeking choices (e.g., altered sensitivity to punishment and reward; Eshel & Roiser, 2010). A behavioral economics model of help-seeking for depression may be able to better account for the aspects of depression that influence decision-making. In particular, behavioral economics highlights potential depression-related differences in sensitivity to the gains and losses of psychotherapy and the effort required to seek psychotherapy, which have not been studied previously in the context of help-seeking. A better understanding of these factors may enhance identification of those with depression who are at risk of going untreated and inform future help-seeking interventions.

Conventional Models of Help-Seeking for Depression

The majority of past research on help-seeking for depression has been based on the Health Beliefs Model (e.g., Gabriel & Violato, 2010) and Andersen's Behavioral Model of Health Services Use (Behavioral Model; Andersen, 1995). The Health Beliefs Model emerged from social psychology research on attitudes toward health behaviors, social norms, and affective responses to seeking help (see Hochbaum, 1958). As such, researchers using this model often focus on predicting and increasing help-seeking for depression based on individuals' positive and

negative judgements about treatment, perceptions of stigma, and mental health literacy factors (e.g., recognition of mental health symptoms, etiological beliefs; Angermeyer & Schomerus, 2017; Jorm, 2012; Li et al., 2014). Evidence has generally supported associations of these variables with help-seeking in general population samples with elevated psychological distress (Bonabi et al, 2016; Gabriel & Violato, 2010). However, findings regarding their predictive power among individuals with depression have been mixed (Jorm et al., 2002; Magaard et al., 2017). In addition, interventions seeking to increase help-seeking by improving attitudes or stigma related to treatment have had no effect (Gulliver et al., 2012) or negative effects among those with depression (i.e., leading to higher stigma and lower treatment-seeking intentions; Lienemann & Siegel, 2018; Siegel et al., 2019).

In contrast to the Health Beliefs Model, the Behavioral Model, which has its roots in psychiatry and public health research on help-seeking, focuses on broad contextual factors that may facilitate or hinder receiving care (Andersen, 1995). These contextual influences are commonly referred to as predisposing factors (e.g., age, education, race and ethnicity), enabling factors (e.g., income, health insurance coverage, social support), and need factors (i.e., perceived and evaluated severity of symptoms; Andersen, 1995; Babitsch et al., 2012). Unique, robust associations between these factors and help-seeking have been found among individuals with depression and other mental health concerns in a variety of contexts (Dhingra et al., 2010; Kim et al., 2019; Magaard et al., 2017), though the directions of certain associations can differ depending on the population (e.g., positive association between social support and help-seeking among women, but an inverse relationship between these variables among men; Andrea et al., 2016). Large-scale interventions to enhance enabling factors, such as implementing health insurance parity laws for mental healthcare, have also led to higher service utilization among

individuals with general psychological distress (Harris et al., 2006). However, the effects of such efforts on the behavior of those with depression in particular is unknown.

Taken together, the Health Beliefs Model and Behavioral Model identify several individual-level (e.g., attitudes) and systems-level factors (e.g., health insurance coverage) that are associated with help-seeking. Interventions that address some of these system-level factors in particular have been found to increase access to care (Harris et al., 2006). However, these models do not specifically account for ways that experiencing depression may influence decisions about seeking psychotherapy. For instance, efforts to increase positive attitudes toward seeking help have been interpreted negatively by some with depression due to negative beliefs regarding themselves and the future (Clark & Beck, 1999; Siegel et al., 2016). Such beliefs may explain the null or negative effects of attitudinal interventions on help-seeking in depressed samples (Gulliver et al., 2012; Lienemann & Siegel, 2018; Siegel et al., 2019). Additionally, findings regarding higher sensitivity to aversive consequences (Eshel & Roiser, 2010) among individuals with depression suggest that they may more vulnerable to barriers such as financial or time costs associated with psychotherapy even after these have been mitigated by factors such as improved insurance coverage. As such, models that account for the potential effects of depression-related factors on help-seeking choices are needed.

A Behavioral Economics Model of Help-Seeking for Depression

Behavioral economics draws on traditional economic theory and behavior analysis research on decision-making. Specifically, traditional economic theory holds that individuals behave in ways that lead to the highest personal benefits at the lowest costs (Rice et al., 2017). This assumes that individuals (1) have unlimited access to complete, accurate information about the consequences of each available choice and (2) are able to accurately weigh all relevant

information to determine which choice is optimal. However, these conditions are infrequently met, and suboptimal decisions are common (Baker & Nofsinger, 2010). In order to address these limitations, behavioral economics examines biases in decision-making (e.g., default bias; Thaler & Sunstein, 2008) and individual differences in sensitivity to various aspects of the consequences of choices (i.e., operant principles).

Related to these operant principles, behavioral economics examines individual differences in sensitivity to gains and losses and sensitivity to various aspects of gains and losses (e.g., delay discounting, effort discounting; Madden & Bickel, 2010). In terms of sensitivity to gains and losses, research indicates that individuals differ in their tendencies to alter their behavior in order to select options that lead to the highest gains: some are able to quickly learn what choices lead to optimal consequences, while others struggle to adjust their decision-making to respond to current contingencies (e.g., Smoski et al., 2008). In particular, individuals with depression have demonstrated deficits in optimizing gains in response to feedback and report lower subjective pleasure when experiencing gains, which suggests maladaptive alterations in sensitivity to gains and losses (Eshel & Roiser, 2010; Must et al., 2013). Altered sensitivity to gains and losses is also manifest in cognitive factors associated with depression, such as mood congruent biases (i.e., increased attention to and memory for negative information), magnification of negative stimuli, and maximization of negative stimuli (Armstrong & Olatungi, 2012; Clark & Beck, 1999). Taken together, depression appears to be associated with elevated behavioral sensitivity to losses, reduced responsivity to gains, and greater subjective perceptions of losses relative to gains.

In addition to examining sensitivity to gains and losses, behavioral economics also quantifies how individuals devalue gains and losses as certain aspects of those gains and losses

change. While there are several such aspects (e.g., delay, probability; Madden & Bickel, 2010), one aspect relevant to the current discussion is effort. Specifically, effort discounting refers to the devaluation of a reward as the effort required to receive it increases (Garamia & Moustafa, 2021). In a measure of effort discounting, for example, a participant may be asked to indicate their preference between a small monetary reward that requires no effort and a large monetary reward that requires physical or cognitive effort (e.g., Mies et al., 2018). The amount of effort required for the large reward is then adjusted incrementally until the participant switches from their initial preference to choosing the alternative option; the point at which this occurs is called the indifference point. The same procedure is then repeated with varying amounts of reward and effort, and the resulting indifference points can then be plotted to examine individual rates of effort discounting. Individual discounting rates can also be combined to examine discounting at the group level. Individual differences in effort discounting have been associated with outcomes such as alcohol use disorder severity (Phung et al., 2019), amotivation symptoms in psychosis (Chang et al., 2019), and lower self-reported daily effort expenditures (Culbreth et al., 2019).

Individuals with depression have been found to display elevated rates of effort discounting (Culbreth et al., 2017; Eshel & Roiser, 2010). For instance, Clery-Melin et al. (2011) found that compared to asymptomatic participants, those with depression failed to increase their level of physical effort in order to obtain larger, hypothetical monetary rewards. In spite of this, the depressed participants reported higher ratings of subjective effort expenditures. Similarly, depressed individuals with anhedonia symptoms (i.e., difficulty experiencing pleasure) were less likely to increase their amount of effort in order to obtain, larger, more likely rewards (Treadway et al., 2012). In addition, animal models of depression indicate that rats are more likely to opt for smaller, less effortful food rewards following experimentally induced stress (Shafiei et al., 2012),

suggesting a potential causal relationship between depressive symptoms and effort discounting. Taken together, these findings suggest increased sensitivity to effort among individuals with depression, which may increase the likelihood of suboptimal decisions.

Sensitivity to gains, losses, and effort (i.e., effort discounting) are likely to be relevant to decisions regarding seeking psychotherapy. For instance, individuals with greater depressive symptoms may anticipate that fewer gains and more losses will result from psychotherapy due to differential sensitivity to gains and losses, mood congruent biases, and minimization of positive stimuli and maximization of negative stimuli. Additionally, altered behavioral sensitivity to gains and losses among individuals with depression could result in going without psychotherapy even if some anticipate that it would be highly beneficial. This problem could be further compounded by high rates of effort discounting among individuals with depression. Specifically, if the gains of seeking psychotherapy require significant effort, this may lead to further devaluation of these gains and result in the anticipated losses of psychotherapy weighing more heavily. For instance, if an individual with depression avoids initiating psychotherapy because of financial costs (i.e., due to high sensitivity to losses) help-seeking may be even less likely if it also requires expending significant effort to find an in-network provider. As such, sensitivity to gains, losses, and effort likely operate simultaneously to influence help-seeking among those with depression. However, gains, losses, effort, and behavioral sensitivity to these factors have not been examined in the context of help-seeking for depression.

The Current Study

The current study aims to examine the effects of a number of behavioral processes on help-seeking among individuals with depression. First, it was hypothesized that depressive symptoms would be positively associated with anticipated losses of seeking psychotherapy,

negatively associated with anticipated gains of seeking psychotherapy, and positively associated with the level of anticipated effort required to seek psychotherapy. Further, it was hypothesized that depression would be associated with sensitivity to each of these factors (i.e., negatively associated with sensitivity to gains, positively associated with sensitivity to losses, and positively associated with effort discounting). These hypotheses were based on findings that individuals with depression demonstrate lower sensitivity to gains, biases such as minimization of positive information and maximization of negative information, higher subjective perceptions of effort expenditures, and higher effort discounting rates (Armstrong & Olatungi, 2012; Clark & Beck, 1999; Clery-Melin et al., 2011; Culbreth et al., 2017; Eshel & Roiser, 2010; Must et al., 2013). Second, it was hypothesized that the anticipated gains, losses, and effort associated with seeking psychotherapy would prospectively predict psychotherapy use and intentions to seek psychotherapy. This was based on the theoretical importance of gains, losses, and their various parameters (i.e., effort) in decision-making (Baker & Nofsinger, 2010; Garamia & Moustafa, 2021; Rice et al., 2017). Third, it was hypothesized that sensitivity to gains would moderate the relationship between gains of psychotherapy and help-seeking (i.e., stronger effects at higher levels of sensitivity to gains), that sensitivity to losses would moderate the relationship between losses of psychotherapy and help-seeking (i.e., stronger effects at higher levels of sensitivity to losses), and that effort discounting would moderate the association between effort required to seek psychotherapy and help-seeking (i.e., stronger effects at higher rates of effort discounting).

Chapter 2: Literature Review

Characteristics of Depression

A number of behaviors or symptoms characterize depressive disorders. In particular, depressed mood and/or insensitivity to the reinforcing properties of previously enjoyable activities are the core features of the two most prevalent diagnoses, Major Depressive Disorder (MDD) and Persistent Depressive Disorder (PDD; American Psychiatric Association, 2013). These symptoms must persist for most of the day, nearly every day, for at least 2 weeks for MDD or 2 years for PDD. In addition, a number of other symptoms must be present, such as fatigue, sleep disturbances, difficulty concentrating, thoughts of death, changes in appetite or weight, psychomotor changes, and feelings of worthlessness or guilt. Finally, these experiences must cause significant distress or functional impairment.

Importantly, the diagnostic criteria for depressive disorders allow for substantial heterogeneity in symptoms among individuals with depression. For example, specifiers such as, “with anxious distress,” “with psychotic features,” and “with peripartum onset,” can be added to a diagnosis of MDD or PDD (American Psychiatric Association, 2013). In addition, the etiology of these disorders varies widely, though environmental changes, such as aversive life events or loss of reinforcement, often underlie the condition (e.g., Kanter et al., 2008). For instance, one individual’s symptoms of MDD may result from complications in grieving a loss, while another’s may be caused by changes in health status that disrupt daily routines. Additionally, there are high rates of comorbidity between depressive disorders and other diagnoses, especially anxiety and substance use disorders (Hasin et al., 2018; Rohde et al., 1991). As such, individuals with depression are highly variable in terms of symptoms and etiology.

In spite of this variability, there are several features that are commonly observed among those with depression. Core cognitive features include negative schemas (negative verbal behavior related to oneself, the environment, and the future; McGinn, 2000), mood-congruent biases (increased sensitivity to aversive stimuli and negative interpretations of ambiguous stimuli when experiencing depressed mood; Armstrong & Olatungi, 2012; Everaert et al., 2014; Panchal et al., 2019), and errors in sensitivity to feedback (e.g., minimizing positive information and magnifying negative information; Clark & Beck, 1999). In addition, those with depression often display behavioral features such as increased avoidance of unpleasant stimuli and constriction of behavioral repertoire (i.e., decreased attempts to engage in rewarding behaviors; Dimidjian et al., 2011; Kanter et al., 2008, 2010), as well as altered sensitivity to punishment and reward (i.e., lack of responsiveness to punishment and lower anticipated and experienced pleasure from rewards; Eshel & Roiser, 2010). Notably, these behavioral factors may affect help-seeking (Brenner et al., 2020; Siegel et al., 2016). Thus, although there is variability among individuals with depression, help-seeking efforts can account for certain characteristics that are common in this population.

Theoretical Models of Help-Seeking for Depression

The majority of research on help-seeking for depression in particular and for mental health concerns more broadly has been based on two theoretical models: the Health Beliefs Model (e.g., Gabriel & Violato, 2010) and the Behavioral Model of Health Services Use (Behavioral Model; Andersen, 1995). While the Health Beliefs Model focuses on beliefs about mental health problems and mental healthcare, the Behavioral Model identifies general contextual and personal characteristics associated with seeking help. Here, concepts and evidence related to these models are reviewed.

Health Beliefs Model

The concepts of the Health Beliefs Model are based on two sets of conditions that affect help seeking: mental health literacy and attitudinal factors. Mental health literacy includes the ability to recognize or discriminate one's own mental health problems; verbal statements (i.e., beliefs) about treatment and the causes of mental health problems; experience or knowledge of how to access care; and experience and knowledge of how to cultivate positive mental health (Angermeyer & Schomerus, 2017; Jorm, 2012). Attitudinal factors typically include attitudes (i.e., positive and negative overt and covert verbal statements) related to seeking help, stigma, and concerns about self-disclosure (Li et al., 2014).

A number of mental health literacy and attitudinal factors have been associated with help-seeking (e.g., Li et al., 2014). For example, in some studies (e.g., Bonabi et al., 2016), the ability to discriminate one's own symptoms of depression were associated with higher probability of help-seeking. Moreover, knowledge of treatments for depression, as well as proactive statements and rule-governed behaviors (i.e., positive attitudes) toward seeking help (e.g., "Seeing a mental health professional is an effective way to improve health."), prospectively predicted help-seeking in a community sample with general psychological distress (Bonabi et al., 2016). In a review that primarily included non-clinical samples, failing to discriminate symptoms of depression and engaging in covert verbal statements regarding negative social outcomes for seeking help (i.e., stigma) were also associated with lower likelihood of help-seeking (Gabriel & Violato, 2010).

Among those with depression and anxiety symptoms specifically, some studies suggest that verbal statements (i.e., rule governed behavior) about the efficacy of professional mental healthcare have not consistently predicted treatment-seeking (Jorm et al., 2002). Similarly, studies that use quantitative measures of stigma have failed to predict help-seeking among

depressed individuals in spite of qualitative reports of stigma concerns (Rodrigues et al., 2014). In addition, a review of help-seeking behaviors among depressed participants found mixed results for associations of attitudinal factors with help-seeking (Magaard et al., 2017). For instance, there were no significant associations of help-seeking with endorsing stigmatizing statements about mental health problems, but significant associations were found with desired interpersonal distance from those with mental illnesses. Thus, there may be aspects of verbal behavior (i.e., belief-related barriers) that current approaches do not fully capture among those with depression. Indeed, even experimental interventions that have increased positive verbal statements regarding treatment, such as public service announcements advertising psychotherapy, have failed to increase the likelihood of actually seeking help (Gulliver et al., 2012). In fact, such interventions have sometimes led to more negative verbal behavior related to help-seeking among individuals with depression (i.e., higher stigma and lower treatment-seeking intentions; Lienemann & Siegel, 2018; Siegel et al., 2019).

The mixed findings regarding the Health Beliefs Model among those with depression may be due in part to a lack of attention to the effects of depressive symptoms on sensitivity to punishment and reward. For instance, even if an individual with depression is led to engage in more positive verbal behavior related to treatment (i.e., positive treatment attitudes), high sensitivity to the aversive aspects of help-seeking may still result in low help-seeking likelihood. Additionally, an over-reliance on secondary factors (e.g., beliefs and attitudes), rather than individualized environmental contexts and experiences that directly influence help-seeking, could hamper prediction. For example, if a person was ridiculed by a family member for previously seeking mental healthcare, then experiences of social ridicule may more precisely

predict lack of seeking help than generic measures of verbal behavior related to the social consequences of treatment (i.e., perceived public stigma).

Behavioral Model of Health Services Use

The Behavioral Model of Health Services Use (i.e., Behavioral Model) is another framework that has been used to study help-seeking for depression. Although there have been variations in descriptions of the model, the core concepts are most often divided into predisposing factors (e.g., age, education, race and ethnicity), enabling variables (e.g., income, health insurance coverage, social support), and need factors (i.e., perceived and evaluated severity of symptoms; Andersen, 1995; Babitsch et al., 2012). In general, evidence supports unique associations of these factors with help-seeking (Dhingra et al., 2010). However, the directions of the associations have varied by population and context (Babitsch et al., 2012). For example, older adults in the U.S. have been found to use mental health services less frequently than younger adults overall (Stockdale et al., 2007), but the opposite appears to be true among Latina immigrants in particular (Hochhausen et al., 2011). As such, the nature of these associations may not always generalize across groups.

A number of studies have found evidence supporting the Behavioral Model in the context of seeking help for depression (Magaard et al., 2017). In a national Korean sample, older age and lower income were negatively associated with seeking help among those with elevated depressive symptoms (Kim et al., 2019). Among Australian adults, need factors and social support (an enabling factor) were positively associated with use of mental health services for depression in the previous year (Graham et al., 2017). However, in the U.S., social support has been found to be positively associated with help-seeking for depression among women and negatively associated with help-seeking among men (Andrea et al., 2016). Further, intersections

of predisposing and enabling factors, such as socioeconomic status, immigration status, and gender, may also affect likelihood of seeking help among those with depression (O'Mahony & Donnelly, 2010). On the whole, findings indicate that a number of predisposing, enabling, and need factors from the Behavioral Model are associated with help-seeking for depression, but the nature of these associations is complex.

There have been few experimental attempts to increase depression help-seeking based on the Behavioral Model. This is likely because many of the predisposing, enabling, and need factors are demographic in nature—that is, they are difficult or impossible to manipulate (Magaard et al., 2017). Some evidence, though, comes from examinations of the effects of U.S. health insurance parity laws on mental health services use. Harris and colleagues (2006) used a large national sample ($N = 83,531$) of private health insurance enrollees to track mental health services use from 2001 to 2003, a period in which some, but not all, U.S. states passed health insurance parity laws. The authors found that compared to states that did not adopt parity laws, mental health services use after the laws were implemented increased substantially among individuals with elevated psychological distress. Similarly, increases in the use of some behavioral health services were also found after national U.S. parity laws were passed in 2010 (Friedman et al., 2017).

These results provide strong evidence for significant increases in help-seeking after enhancing insurance coverage (an enabling factor). It is unclear, however, what effect this has on help-seeking for depression specifically. It may be that individuals with depression would increase their help-seeking at similar rates to what Harris and colleagues (2006) found among those with general psychological distress. However, the changes in sensitivity to consequences that depression causes could also render such efforts less effective in depressed populations. For

example, reduced sensitivity to reinforcement could decrease the value of enabling factors and disproportionately increase sensitivity to barriers. This has not been tested, though. In sum, factors from the Behavioral Model appear to predict help-seeking for depression and to affect seeking help for mental health concerns in general. At the same time, there are inconsistencies in the directions of associations of some factors with help-seeking (e.g., Hochhausen et al., 2011; Stockdale et al., 2007), and the effects of interventions based on this model for those with depression are unknown.

Health Beliefs and Behavioral Models: Strengths and Limitations

The Health Beliefs Model and the Behavioral Model have a number of important strengths. First, the two models identify a wide range of individual and system-level factors associated with help-seeking. This provides several potential targets for help-seeking interventions. In addition, some support for these models has been found in a variety of populations (Angermeyer et al., 2017; Magaard et al., 2017), indicating the generalizability of many of the help-seeking barriers and facilitators they identify.

In spite of these strengths, these models also have limitations in the context of depression. Notably, most studies have not explicitly addressed the behavioral features of depression that may affect sensitivity to help-seeking barriers and facilitators. Further, current approaches to addressing the barriers identified by the Behavioral Model and Health Beliefs Model have had unknown or negative effects on those with depression (e.g., Lienemann et al., 2013). Taken together, help-seeking research may benefit from more explicitly accounting for changes in behavioral sensitivity to consequences that may influence help-seeking. This could lead to more accurate identification of those at highest risk of going untreated and to more effective help-seeking interventions.

Behavioral Economics: A Theoretical Model Applied to Help-Seeking for Depression

Behavioral economics draws on traditional economics theory and behavior analysis research on choice and decision-making. Specifically, traditional economics theory holds that individuals behave in ways that lead to the greatest gains and the fewest losses (Rice et al., 2017). However, findings from the experimental analysis of behavior suggest that suboptimal decisions are common due to differential sensitivity to gains and losses (e.g., overvaluation of losses relative to gains), various parameters of gains and losses (e.g., the amount of delay between an action and its consequences), and individual differences in sensitivity to these parameters (i.e., discounting; see Madden & Bickel, 2010). Additional biases in decision-making, such as influences of past behavior and familiarity with a given option (Baker & Nofsinger, 2010), also have been found to bias decision-making.

Past research has identified broad decision-making differences between individuals with and without elevated depressive symptoms (e.g., Amlung et al., 2019). However, there is also significant variability among individuals in sensitivity to gains and losses, their various parameters, and susceptibility to decision-making biases (e.g., Lv et al., 2021). In addition, discounting processes in particular can be affected by transient characteristics of the current context. For instance, differences in how options are framed (e.g., emphasizing that an option with immediate gain entails forgoing future rewards) and the emotional state of the decision-maker can alter sensitivity to delays (Rung & Madden, 2018). As such, behavioral economics processes have both trait (individual differences) and state-like qualities. However, evidence regarding between-group differences is also useful for informing applied help-seeking interventions. Specifically, interventions encouraging help-seeking for depression must account for group-level characteristics to optimize effectiveness at the population level. Because of this,

the following discussion focuses primarily on evidence related to group-level differences in decision-making processes that may affect help-seeking among individuals with depression.

Gains and Losses

Gains and losses refer to the reinforcing and aversive consequences, respectively, of behaviors. Individuals frequently experience both gains and losses when seeking help for depression. For instance, there may be increases in quality of life and symptom reduction in addition to financial and time losses associated with paying for and attending healthcare appointments.

As previously noted, those with depression often display lower sensitivity to rewards and lower responsiveness to punishment (Eshel & Roiser, 2010). In addition, this may be especially true for individuals with depression who experience symptoms of anhedonia, or subjective difficulty experiencing pleasure (Borsini et al., 2020). For instance, depressed participants who displayed a lack of responsiveness to reward in a behavioral choice task (i.e., failing to learn to select options associated with greater rewards) reported higher levels of anhedonia at a 1-month follow-up (Pizzagalli et al., 2005). Findings from the animal literature also indicate that rats that demonstrate anhedonia symptoms, such as decreased sucrose intake and lower responsiveness to stimulation of reward-related brain regions, also show impairments in reward learning (Moreau, et al., 1996; Moreau, 2002). As such, those with depressive symptoms such as anhedonia may respond differently to gains and losses when making help-seeking decisions. Further, mood-congruent biases (e.g., increased sensitivity to negative stimuli; Armstrong & Olatungi, 2012; Everaert et al., 2014) and magnification of aversive stimuli and minimization of reinforcing ones (Clark & Beck, 1999) might cause the potential losses of seeking help to have a disproportionate influence on behavior (Siegel et al., 2016). For instance, even if the gains of help-seeking are

greater in magnitude than losses, a person with depression who is particularly prone to magnify aversive stimuli and has low sensitivity to reward may have a low likelihood of seeking help. Notably, gains and losses in a behavioral economics framework could include a wide range of factors from both the Health Beliefs Model and Behavioral Model, such as insurance coverage and income (i.e., monetary losses) and stigma (i.e., social losses).

Effort

Although rarely studied explicitly in the help-seeking literature, effort is also likely to play a role in help-seeking for depression. For example, many aspects of initiating treatment (e.g., finding an in-network provider; scheduling and attending appointments) and of depression treatments themselves (e.g., medication compliance, psychotherapy attendance) can be effortful. Indeed, findings regarding the low rate of homework completion in psychotherapy highlight the difficulty of engaging in effortful components of interventions (Garland & Scott, 2002).

The fact that help-seeking is effortful is compounded by findings that some individuals are highly sensitive to effort (i.e., high effort discounting). Effort discounting refers to the devaluing of rewards as the amount of effort required to receive them increases (Garamia & Moustafa, 2020). In other words, individuals who are high in effort discounting tend to pursue smaller rewards that require less effort rather than larger, more effortful rewards. For example, Nishiyama (2014) found that as the amount of hypothetical effort required to obtain a monetary reward increased, participants became more likely to forgo the reward. Additionally, rates of effort discounting varied among individuals in the study. Although conceptually related to delay discounting—rewards that require more effort often entail greater delays—measures of effort and delay discounting have been found to load onto distinct factors, indicating that they are independent processes (Białaszek et al., 2019).

On average, those with depression engage in steeper effort discounting than those without depression (Culbreth et al., 2018; Eshel & Roiser, 2010; Shafiei et al., 2012). That is, depressed individuals tend to be more sensitive to increases in effort required to obtain probabilistic monetary rewards and less likely to increase their level of effort to obtain larger, more likely rewards (Treadway et al., 2012). Others (Yang et al., 2014) have also found that higher effort discounting among those with depression is associated with lower levels of subjective pleasure upon receiving rewards, suggesting the role of reduced sensitivity to reinforcement. Although less studied, other factors could also contribute to effort discounting in depression. For example, avoidance of the aversive stimuli associated with expending effort or constriction of one's behavioral repertoire due to low rates of reinforcement could also lead to lower effort expenditures.

Given the effort required to seek treatment and high rates of effort discounting among individuals with depression, this process may be an especially important consideration when working with depressed populations. For instance, when choosing between the effortful option of seeking help and options that require less effort (e.g., maintaining the status quo, using substances to cope), an individual with depression who is high in effort discounting may choose the latter. Importantly, due to the discounted value of the effortful gains of help-seeking, effort discounting could cause some to go without help even if they anticipate that treatment will be highly beneficial. As such, accounting for sensitivity to effort may add incremental validity to help-seeking approaches that only measure anticipated gains and losses.

Delay

Although not directly relevant to the aims of this dissertation, a discussion of other behavioral economics factors that may affect help-seeking is also warranted. In particular, delay

is an additional parameter of gains and losses that may influence decisions to seek help. Delays are a common component of the help-seeking process. For instance, many individuals are placed on waitlists after initial contact with a clinic, and there are often additional delays before experiencing treatment benefits (MacDonald et al., 2021). In contrast, there is often little delay in experiencing losses related to seeking help. For example, financial and time losses of mental healthcare may be experienced immediately, and discomfort with disclosure and experiences of stigma can be experienced well before treatment leads to a full recovery (Corrigan, 2004).

As in the case of effort, the observation that delays are an inherent part of help-seeking is complicated by evidence that there are individual differences in sensitivity to delay (i.e., delay discounting; Madden & Johnson, 2010; Mazur, 1987). Delay discounting is the devaluing of an outcome as the delay to its receipt increases. In research concerning discounting-related choice patterns in humans, researchers pose a series of choices in which participants choose between a relatively small, immediate monetary reward (e.g., \$10 now) and a larger, delayed monetary reward (e.g., \$100 in 1 day; Rachlin et al., 1991). Over the course of the choices, the smaller, sooner amount is raised incrementally to identify the point at which the individual switches from choosing the larger, delayed amount to choosing the smaller, sooner amount. This value, termed the indifference point, represents the current subjective value of the larger reward. When these indifferent points are plotted across different delay periods (e.g., 1 week, 1 month, 6 months), individual differences in sensitivities (i.e., discounting rates) to these delays can be determined. In addition, this same process can be used to determine sensitivity to delays in experiencing losses by posing questions about preferences between smaller, sooner losses and larger, delayed losses (e.g., a loss of \$10 now versus \$20 in 1 day; Engelmann et al., 2013).

A large body of literature shows that delay discounting is a process that is present in those with behavioral health-related challenges such as substance use disorders (e.g., Bickel & Marsch, 2001; Bickel et al., 1999; Heil et al., 2006; Madden et al., 1999; Petry, 2001), obesity (Appelhans et al., 2011; Fields et al., 2011; Rasmussen et al., 2010; Schlam et al., 2013; Weller et al., 2008), chronic gambling (Holt et al., 2003), and with those who struggle with food insecurity (Rodriguez et al., 2021). In addition, delay discounting of gains and losses has been found to be steeper among those who are depressed (Amlung et al., 2019; though for an exception, see Lempert & Pizzagalli, 2010). For example, participants with depression, compared to healthy controls, demonstrated stronger preferences for smaller-sooner monetary rewards over larger, delayed ones, and stronger preferences for larger-later monetary losses over smaller, more immediate ones (Engelmann et al., 2013; Pulcu et al., 2014; Mies et al., 2016).

In the context of help-seeking, increased sensitivity to delay (i.e., higher rates of delay discounting) may constitute a significant barrier for individuals with depression. For example, in a choice between the immediate gains of temporary symptom relief through avoidance versus the larger (and delayed) gains of seeking help, a person with depression who is high in delay discounting may favor the former. Similarly, when faced with the choice of an immediate loss (e.g., discomfort during a mental healthcare appointment) and a delayed loss (e.g., future worsening of depressive symptoms), high delay discounting of losses would favor the latter. Some initial evidence has been found related to this. In a clinical population with steep rates of delay discounting (individuals with Alcohol Use Disorder) those who were seeking treatment were lower in delay discounting than those who were not seeking help (Gowin et al., 2019). As such, delay discounting may be relevant in clinical populations with steep discounting rates, which may include many individuals with depression.

Probability

An additional parameter of the gains and losses of seeking help is probability. Although treatments for depression have been shown to be effective in general, they are not equally effective for everyone (Kamenov et al., 2017). As a result, the gains of help-seeking (i.e., recovery) are probabilistic. Further, some of the potential losses of seeking help are probabilistic. For instance, even if it is unlikely that a particular individual with depression will be ridiculed for seeking help, the probability of this may be greater than zero and may still exert an effect on help-seeking decisions.

The effects of probabilistic gains and losses on help-seeking decisions may depend on individual differences in sensitivities to risk and loss (i.e., probability discounting; Green & Meyerson, 2010). Probability discounting is a behavioral process that describes changes in the subjective value of gains and losses as the odds for and against their receipt change. This allows for examining both risk and loss aversion. For example, in a probability discounting measure of risk aversion, participants might be asked to indicate a preference for either a 100% chance of receiving \$20 or a 50% chance of receiving \$50 (e.g., Holt et al., 2003). Mathematically, the value of \$50 at 50% probability is $\$50 \times 0.50 = \25 , and so it is the optimal choice. As such, opting for the guaranteed \$20 is considered a risk-averse decision because it entails taking a lesser option to avoid the risk of receiving no reward. On the other hand, in a measure of loss aversion participants could be asked to choose between the status quo (i.e., a 100% chance of a gain/loss of \$0) or a gamble with a 50% probability of gaining \$50 and a 50% probability of losing \$40 (Huh et al., 2016). The optimal decision in this case is the gamble ($\$50 \times 0.50 = \25 gain, versus $\$40 \times 0.50 = \20 loss). Thus, those who choose the certainty of a \$0 gain/loss would be considered loss-averse because they make a suboptimal choice in order to avoid a

potential loss. Similar to delay and effort discounting, rates of probability discounting vary among individuals (Green & Meyerson, 2010).

In considering probability discounting and depression, results have been mixed. Some depressed participants have demonstrated higher risk aversion (Engelmann et al., 2013) and loss aversion (Huh et al., 2016), while others have found that those with Major Depressive Disorder (MDD) are equal in risk aversion to healthy controls (Hart et al., 2019). Engelmann et al. (2017) similarly found that those with MDD showed no differences from healthy controls in risk or loss aversion, but latency in choices involving losses was higher among those with depression, implying a potential role of mood-congruent biases in decision-making (i.e., greater attention to negative information). However, a different experimental probability choice procedure, the Iowa Gambling Task, has consistently found higher risk and loss aversion in depressed individuals, potentially because it specifically captures changes in choice behavior in response to feedback (i.e., sensitivity to punishment and reward; Must et al., 2013). Additionally, research in animal models of depression has found higher rates of risk-averse responding among rats with congenital learned helplessness (i.e., hyperactive lateral habenula; Shabel et al., 2014). Taken together, those with depression may be higher in risk aversion and loss aversion in some contexts, but this may not always be manifest in probability discounting tasks.

In light of the probabilistic outcomes of help-seeking and potential differences in risk and loss aversion among those with depression, probability discounting may also be relevant to depression help-seeking. For example, if alternative strategies to cope with depression (e.g., substance use) are certain to bring gains in the form of temporary alleviation of depressive symptoms, help-seeking may be unlikely if the gains of this option are uncertain. In line with this, one study found that among participants with anxiety disorders, those who had not sought

help were higher in self-reported risk aversion than those seeking treatment (Lorian & Grisham, 2011). In the case of loss aversion, help-seeking might also be less likely when there is a potential for loss in addition to gain. Specifically, if an individual with depression is highly loss averse, they may opt not to seek help even if the probability of gains is higher than the probability of losses (i.e., disproportionate sensitivity to the probability of losses).

Consequences to Others

Depression often has significant negative effects on individuals who are close to the afflicted individual. For instance, family members of patients with depression have reported experiencing isolation, blame, and increased fears of experiencing mental health challenges of their own (Corrigan & Miller, 2004; Highet et al., 2004). Similarly, individuals often report seeking treatment in order to repair relationship difficulties related to their mental health concerns (Rosen et al., 2013; Suurvali et al., 2010). Indeed, enhancing interpersonal outcomes is the focus of multiple forms of treatment for depression (e.g., couples therapy for depression, interpersonal therapy; Cuijpers et al., 2011; Whisman et al., 2012). As such, the gains and losses experienced by emotionally close others as a result of treatment may be an important consideration in help-seeking decisions.

Prior research has found individual differences in sensitivity to gains and losses experienced by close others (i.e., social discounting; Rachlin & Jones, 2010), which may influence the extent to which these consequences impact help-seeking. Specifically, social discounting refers to the tendency to devalue rewards given to others as the amount of emotional distance between oneself and the recipient increases. For example, social discounting tasks with humans often ask participants to imagine they have made a list of the people emotionally closest to them (e.g., in order from 1 to 100; Bradstreet et al., 2012). They then are presented with

options such as, “Would you prefer \$40 for you alone, or \$80 for the N^{th} person on your list?” Individuals whose preferences quickly shift towards receiving personal gains as social distance increases are considered to be steeper in social discounting than those whose preferences are less affected by increases in social distance. Although the social discounting literature is newer than some other forms of discounting, comparable results have been found across non-human (Yamaguchi et al., 2019) and human samples (e.g., hyperbolic discounting functions; Jones & Rachlin, 2006), providing evidence for the robustness of this process.

There has been very little research on social discounting among individuals with depression, and no social discounting research using animal models of depression has been conducted. Only one study has reported associations between depressive symptoms and social discounting: among perinatal women, depressive symptoms were positively associated with social discounting, indicating stronger tendencies to opt for personal gains over gains for others (Bradstreet et al., 2012). However, further evidence is needed to draw generalizable conclusions about the direction of the relationship between social discounting and depression.

Although the association between depression and social discounting is not well understood, this process may still be relevant to help-seeking for depression. For example, an individual with depression who is low in social discounting might be especially likely to seek help in order to benefit individuals who are close to them (e.g., a romantic partner or children). Alternatively, gains for others might have a weaker effect on help-seeking among those who are higher in social discounting. Although not typically examined in social discounting paradigms, it could also be that social discounting of losses (i.e., devaluation of losses experienced by others as social distance increases) is relevant. This may be especially true in cultural contexts in which help-seeking can result in negative consequences for one’s family members (Yang, 2007).

Additional Decision-Making Biases

Aside from differential sensitivity to gains, losses, and various aspects of gains and losses (e.g., delay, effort), additional biases studied in the behavioral economics literature may be relevant to help-seeking for depression. For example, past investments of time, effort, or other resources have been found to have significant effects on behavior in human and animal models (i.e., sunk cost bias; Magalhães & White, 2016; Navarro & Fantino, 2005). As such, if an individual with depression has invested resources into coping with symptoms without seeking help (e.g., through ineffective coping strategies) they may be more likely to persist in this behavior rather than choosing the alternative response of pursuing treatment. In line with this, participants with elevated depressive symptoms were more likely to demonstrate the sunk cost bias and also reported a higher likelihood of delaying seeking psychological help (Jarmolowicz et al., 2016).

Other biases, such as the familiarity bias (i.e., the tendency to choose options to which one has been repeatedly exposed; Foad, 2010) could also be relevant to help-seeking for depression. For instance, if seeking help is an unfamiliar option in a depressed individual's personal history and/or cultural context, then they may display a behavioral bias against help-seeking in spite of suboptimal outcomes. Some evidence does suggest that individuals with genetic characteristics associated with depression (e.g., short allele of the 5-HTTLPR gene; Chew et al., 2012) are more likely to engage in the familiarity bias. However, further research is needed to determine whether this is associated with help-seeking.

Further, default options in an individual's environment could also play a role in help-seeking decisions among those with depression. Specifically, the default bias has been shown to increase the likelihood that individuals will engage in options that represent the status quo (i.e.,

that require “opting out”; Thaler & Sunstein, 2008). This may be particularly true when default options have led to positive consequences in the past (Jona, 2018). Because of this, the fact that going without treatment is the default option may result in many individuals with depression failing to “opting in” to seeking treatment, especially if alternative options have led to some benefits in the past.

In sum, the gains and losses of help-seeking; the delays, effort, probabilities, and social distance associated with these gains and losses; and individual differences in rates of discounting are likely to be related to decisions to seek help for depression. Additional decision-making biases related to past and current behaviors and environmental contexts may also play a role. There is initial evidence for the effects of some of these concepts, such as delay discounting, probability discounting, and sunk cost bias (Gowin et al., 2019; Jarmolowicz et al., 2016; Lorian & Grisham, 2011). Others (gains and losses, effort discounting, social discounting, familiarity and default biases), while conceptually related to help-seeking among those with depression, are still in need of empirical backing.

Based on this evidence and theory, the proposed theoretical model of help seeking asserts three propositions. The first is that help-seeking behavior is determined by (a) the magnitudes of the gains and losses of seeking help; (b) the delays, effort, probabilities, and social distance associated with those gains and losses; and (c) decisional biases associated with other aspects of individuals’ past and current contexts (e.g., sunk cost bias, default bias). Second, it is assumed that individuals with depression have altered sensitivity to gains and losses and their various parameters (e.g., delay, effort), as well as differences in susceptibility to various decisional biases. Third, individual differences in sensitivity to gains and losses, to their various parameters, and to other decisional biases are also assumed to contribute to help-seeking decisions.

As previously noted, there are several behavioral economics factors that are lacking evidence in the context of help-seeking for depression. In particular, while anticipated gains and losses of help-seeking have been measured in research on attitudes toward seeking help, sensitivity to these gains and losses has not been examined. Accounting for sensitivity to gains and losses may be especially relevant to those with depression given differential responsiveness to punishment and reward that has been found in this population. In addition, research on the role of effort and effort discounting is needed since effort discounting has been consistently found to differ among those with depression (Culbreth et al., 2018) and is an important aspect of finding a mental healthcare provider, attending appointments, adhering to treatments, etc. Indeed, because of discounting of effortful gains—such as those associated with psychotherapy—individuals with depression may be less likely to seek help even if they anticipate that it will result in gains. Further, depression likely affects processes related to the effort, gains, and losses of psychotherapy simultaneously (i.e., altering anticipated gains and losses of psychotherapy, changing sensitivities to these gains and losses, and altering perceptions of effort and behavioral sensitivity to effort). As such, research that examines effort and effort discounting in the context of gains, losses, and sensitivity to gains and losses is needed.

Effort Discounting Paradigms and Models

The effort discounting paradigm has its foundations in early experimental animal research and theoretical writings on “work” (Eisenberger, 1992). For example, Tsai (1932) found that when rats were presented with a choice of lifting a heavier door or a lighter door that led to equal amounts of food, the animals consistently chose the lighter door. Based on this and similar findings in animal studies (see Solomon, 1948, for a review), Hull (1943) articulated the law of

minimum effort: given the choice between reinforcers of similar magnitudes, organisms tend to select the option that requires the least effort.

While animal research on work or effort continued throughout the last half of the twentieth century (e.g., Brener & Mitchell, 1989), the first human study of effort discounting was not conducted until 1999. Mitchell (1999) asked participants who smoked tobacco ($n = 20$) and had never smoked ($n = 20$) to indicate their preferences for large monetary rewards that required several seconds of physical effort (e.g., gripping a dynamometer at their previously determined maximum force) and small monetary rewards that were less effortful (e.g., gripping the dynamometer at 10% of their maximum force). The magnitude of the less effortful reward was adjusted incrementally throughout the procedure to determine the points at which participants' preferences switched from the effortful reward to the easier reward (i.e., the indifference points). Indifference points found across participants were then used to calculate group averages in rates of effort discounting. Effort discounting did not differ between the two groups in the study. However, this procedure provided a precedent for quantifying sensitivity to effort in humans.

A number of other behavioral paradigms have since been used to study effort discounting in humans. For example, some have required participants to complete a large number of rapid keystrokes for a large monetary reward versus fewer keystrokes for a smaller reward (Culbreth et al., 2019). Others have instructed participants to simply imagine whether they would prefer to engage in a hypothetical effortful task for a large reward or an easy task for a small reward (Malesza, 2019). Commonly, though, hypothetical tasks that are cognitively effortful are used (i.e., working memory tasks; Chang et al., 2020; Culbreth et al., 2019; Hofmans et al., 2020). For instance, Chang et al. (2019) asked participants to complete an N -back task with varying levels of difficulty. Participants then were asked whether they would hypothetically prefer to complete

a difficult level of the task for a larger monetary reward (e.g., \$4.00) or an easy level for a small reward (e.g., \$1.00). The amount of reward for the easy task and the difficulty of the easier task were then manipulated (e.g., going from a 1-back to a 2-back task) to determine four indifference points for varying levels of difficulty and reward. Plotting these indifference points allowed for examining individual differences as well as group differences in effort discounting rates.

Although such tasks do not involve real rewards, hypothetical effort discounting tasks have been found to produce results that are similar to non-hypothetical tasks (Malesza, 2019) and to correspond to effort expenditures in daily life (Culbreth et al., 2019). As such, hypothetical tasks appear to be an efficient and valid measure of effort discounting.

Researchers have used a variety of methods to analyze data resulting from discounting tasks. Commonly, discounting data are fitted to hyperbolic functions to reflect theoretical explanations of how subjective values of rewards change as the amount of delay or effort to their receipt increase (Garami & Moustafa, 2021; Kirby & Marakovic, 1996). This can be summarized in the following equation (Malesza, 2019):

$$V = A(1 + lE) \quad (1)$$

In this equation, the subjective value of a reward is represented by the parameter V , which is determined by the reward's objective value A , the effort required to receive the reward E , and the hyperbolic effort discounting rate l . For instance, an individual might choose to complete an effortful task for a reward of \$4.00 instead of an easy task with a reward of \$3.00, but they may then opt for an easy task with a reward of \$3.50 over the effortful task for \$4.00. In this case, the subjective value V of the objective value A (\$4.00) would be equal to the midpoint between the two rewards for the easy task, or \$3.25. In other words, the individual is equally likely to choose to complete the effortful task for \$4.00 or the easy task for \$3.25. This is referred to as the

indifference point. The hyperbolic discounting rate l would be determined by a series of indifference points resulting from choices between the effortful task for \$4.00 and other, easier tasks with varying levels of required effort and associated rewards. Specifically, l would be calculated by conducting a non-linear regression analysis with indifference points (i.e., subjective values of the large reward) as the dependent variable and the amount of additional effort required to receive the large reward in comparison with the easier alternative as the independent variable.

While useful, a hyperbolic discounting approach has limitations in the context of inferential statistics. For instance, a hyperbolic function often is a poor fit for certain subsets of participants, which can result in highly skewed distributions of discounting rates and violations of normality assumptions (Myerson et al., 2001). To address this, Area Under the Curve (AUC) has been substituted as an atheoretical indicator of discounting rates (Chang et al., 2019; Myerson et al., 2001). AUC values are determined through a series of steps. First, each participant's indifference points determined from a discounting procedure are plotted as a function of standardized reward values and levels of effort. These indifference points are then connected, which produces a discounting curve for each participant. Next, the area under the discounting curve is divided into segments between each indifference point, creating a series of trapezoids under the curve. The area within each trapezoid is found using the expression $(x_2 - x_1)[(y_1 + y_2)/2]$, where x_1 and x_2 represent consecutive levels of effort and y_1 and y_2 represent consecutive subjective values associated with these levels of effort. Last, the areas of the trapezoids are calculated, and these areas are added together to find the AUC value. This process produces an indicator of the steepness of participants' rates of effort discounting that is independent of theoretical assumptions, and thus able to account for a range of choice patterns.

In sum, effort is an important component of the help-seeking process and is likely to be involved in decisions regarding seeking psychotherapy. Findings from the behavioral economics literature indicate that sensitivity to effort (i.e., effort discounting) varies among individuals and clinical groups, including those with depression (Culbreth et al., 2017). Specifically, individuals with depression have shown higher rates of effort discounting, which likely is due in part to altered sensitivity to gains and losses (Culbreth et al., 2017; Eshel & Roiser, 2010; Treadway et al., 2012). Additionally, sensitivity to gains and losses likely operates simultaneously with effort discounting. For example, the effort required to obtain the gains associated with psychotherapy may contribute to devaluation of these gains, which could be further compounded by high sensitivity to the losses associated with psychotherapy (e.g., financial losses, emotional discomfort). As such, individuals with depression may be especially at risk of going untreated in the face of altered sensitivity to gains, losses, and effort. However, past research has not examined the roles of sensitivity to gains, losses, or effort in decisions about seeking psychotherapy. In addition, evidence is lacking as to whether effort-related processes have independent effects on help-seeking in the context of anticipated gains and losses of seeking help and sensitivity to these gains and losses. Further, while behavioral processes such as delay discounting have been tested in the context of help-seeking (Gowin et al., 2019), the associations of effort-related variables with help-seeking have not been examined. A better understanding of these factors may enhance identification of those at risk of going without treatment and interventions to increase access to care.

The Current Study

The current study tested hypotheses relevant to gains, losses, and effort in the context of a behavioral economics model of help-seeking for depression. Hypotheses are illustrated in Figure

1. First, we tested whether depressive symptoms are associated with the anticipated gains and losses of seeking psychotherapy, anticipated level of effort required to seek psychotherapy, and sensitivity to gains, losses, and effort. Past findings indicate that those with depression are sensitized to aversive consequences and less sensitive to reinforcement in general (Armstrong & Olatungi, 2012; Everaert et al., 2014; Panchal et al., 2019). Thus, it was hypothesized that depressive symptom severity (i.e., total scores on the Patient Health Questionnaire-9; Kroenke et al., 2001) would be positively associated with the anticipated losses of seeking psychotherapy and sensitivity to losses. It was also hypothesized that symptom severity would be negatively associated with the anticipated gains of seeking psychotherapy and sensitivity to gains. Past research also suggests that depressive symptoms are associated with higher perceptions of the effortfulness of certain activities (Clery-Melin et al., 2011). As such, it was hypothesized that depressive symptom severity would be positively associated with the magnitude of the anticipated effort required to seek psychotherapy. Additionally, a large body of research indicates that depression is associated with higher rates of effort discounting (Culbreth et al., 2017; Eshel & Roiser, 2010). Because of this, it was hypothesized that depressive symptom severity would be positively associated with effort discounting rates.

Second, we tested whether the anticipated gains and losses of seeking psychotherapy and the anticipated level of effort required to seek psychotherapy prospectively predicted having sought psychotherapy at a 3-month follow-up. We also tested whether sensitivity to gains, losses, and effort (i.e., effort discounting) moderated the effects of self-reported gains, losses, and effort on help-seeking. Specifically, because previous findings indicate that the gains and losses associated with a particular option have significant effects on behavior (Baker & Nofsinger, 2010; Rice et al., 2017), it was hypothesized that the anticipated gains and losses of seeking

psychotherapy (two separate variables) would be positively and negatively associated with having sought psychotherapy at the 3-month follow-up, respectively. Based on research showing that expending effort is generally aversive (e.g., Eisenberger, 1992), it was also hypothesized that the magnitude of the anticipated effort required to seek psychotherapy would be negatively associated with having sought psychotherapy at the follow-up. In addition, past findings have demonstrated that individuals differ in their levels of behavioral sensitivity to gains, losses, and effort and that this affects the likelihood of pursuing effortful options (Malesza, 2019; Mitchell, 1999; Nishiyama, 2014). As such, it was hypothesized that the effects of losses on help-seeking would be greater at higher levels of sensitivity to losses and that the effects of effort required to seek psychotherapy would be stronger at higher levels of effort discounting. Further, past findings indicate that higher reward sensitivity is associated with pursuing options that may lead to benefits (Eshel & Roiser, 2010). Because of this, it was hypothesized that the positive effects of anticipated gains on help-seeking would be stronger at higher levels of sensitivity to gains.

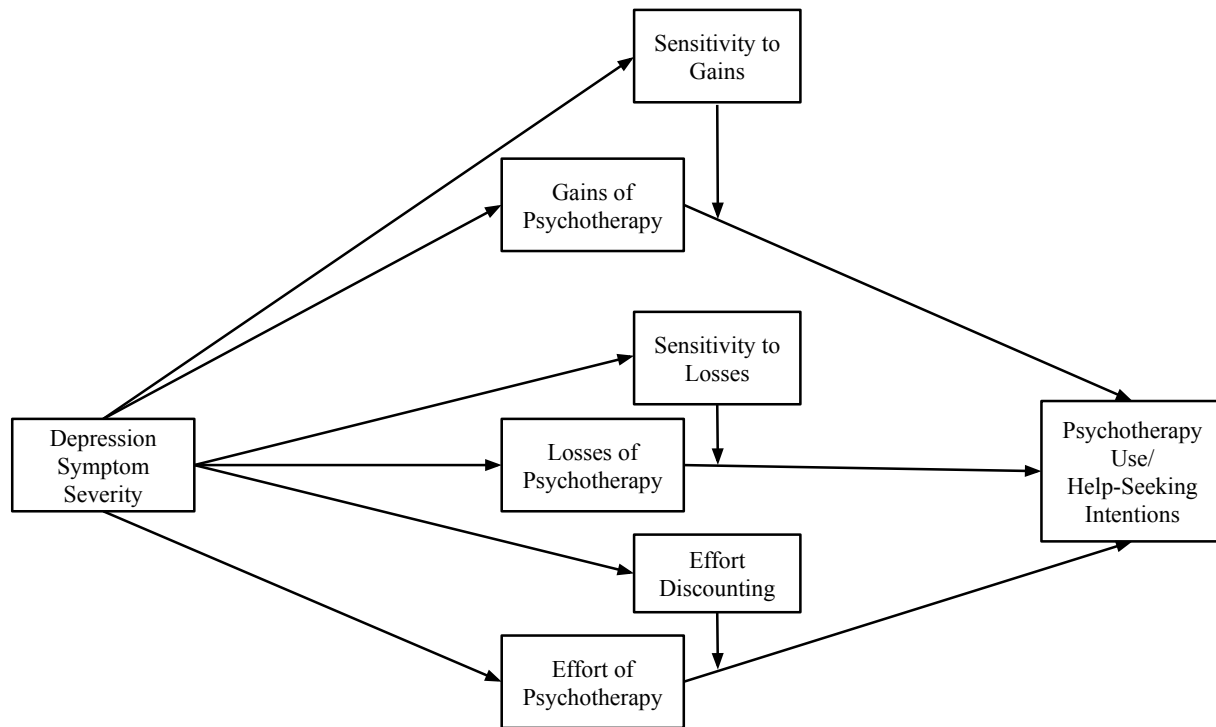
In addition to predicting psychotherapy use at the 3-month follow-up from gains, losses, effort, and sensitivity to these factors at time one, we also used these variables at time one to predict intentions to seek help at the 3-month follow-up. Intentions have been robustly linked with behavior broadly, and intentions to seek psychological help specifically are commonly studied in the literature (e.g., Armitage & Connor, 2001; Demyan & Anderson, 2012; Hammer & Spiker, 2018; Sawyer et al., 2012; White et al., 2018). As such, they are an important predictor of future psychotherapy use. This is especially relevant given that only a minority of individuals with depression seek psychotherapy. Thus, even if few participants were to seek psychotherapy during the 3-month follow-up period, those with more positive help-seeking intentions may be

more likely to seek it in the future. The directions of the hypotheses regarding intentions to seek help were identical to those predicting actual psychotherapy use.

In testing predictors of seeking psychotherapy and help-seeking intentions, COVID-19 diagnosis was explored as a covariate. A COVID-19 diagnosis could affect help-seeking in multiple ways, such as through increasing the amount of physical effort needed to attend appointments, causing financial hardship due to missed workdays, or increasing social isolation. Notably, COVID-19 also appears to have long-term cognitive impacts on some individuals, including potential negative effects on memory (Almeria et al., 2020; Mendez et al., 2021; Vanderlind et al., 2021). Impacts on memory are particularly relevant to the current study because the effort calibration procedure in the effort discounting measure is a working memory task (backwards digit span). Because of this, the associations of a COVID-19 diagnosis with psychotherapy use and help-seeking intentions were tested to determine whether to include it as a covariate in the main analyses.

Figure 1

Hypothesized relationships among variables predicting psychotherapy use and help-seeking intentions



Note. Paths from depression symptom severity to psychotherapy predictors correspond to Hypothesis 1. Paths from gain, loss, and effort-related variables correspond to Hypothesis 2. The model will be run once with seeking psychotherapy as the dependent variable and then again with help-seeking intentions as the dependent variable.

Chapter 3: Method

Participants

Participants were recruited from Amazon Mechanical Turk (MTurk), an online crowdsourcing platform supported by Amazon.com. Previous research indicates that MTurk participants provide valid and reliable data at the same rate as undergraduate samples (Casler et al., 2013; Hauser & Schwartz, 2016; Necka et al., 2016) and have a demographic makeup similar to nationally representative samples of U.S. adults (Burnham et al., 2018; Redmiles et al., 2019). Longitudinal data collection was facilitated by CloudResearch.com, a toolkit designed to enhance MTurk for social science researchers (Litman et al., 2017). The number of participants needed to achieve adequate power for the study analyses (Structural Equation Modeling; see description below) was determined based on the degrees of freedom that the model predicting seeking psychotherapy would have (51). Specifically, MacCallum et al. (1996) found that based on the root mean square error of approximation index (RMSEA) that is used to test overall model fit, models with 50 degrees of freedom require approximately 250 participants to reach 80% power. As such, 250 participants were recruited. They received \$0.20 for the initial survey and \$0.80 plus a \$0.50 bonus for the 3-month follow-up survey (approximately 30 minutes each).

Procedure

Interested participants clicked on the online study link through their MTurk worker dashboard. They were asked to complete the Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001; described in more detail below) as a screening for admission to the study. Only those who received a score of 10 or greater, which indicates moderate depression symptoms or worse, were allowed to participate. An additional reverse coded item was also included in the PHQ-9 as a validity check: “Feeling upbeat, happy, and hopeful.” Those who endorsed this item as being

true for “at least half the days” were excluded. In addition, participants were asked to indicate whether they were currently receiving psychotherapy. Only those who denied current psychotherapy use (and received a 10 or higher on the PHQ-9) were admitted to the study. Finally, participants were asked whether they were willing to complete a 3-month follow-up survey, and only those who indicated they are willing were allowed to participate.

Those who passed the screening questions were then directed to the main study survey. They were asked to complete an informed consent (see Appendix A), fill out a questionnaire on the gains and losses of seeking psychotherapy; the amount of effort required for them to seek psychotherapy; measures of sensitivity to gains, losses, and effort; questions on past help-seeking; demographics; and COVID-19 diagnosis. At the end of the survey, they were shown the link to Psychology Today’s therapist locator tool in the survey termination message (<https://www.psychologytoday.com/us/therapists>).

At the 3-month follow-up, a notification email was sent through CloudResearch.com to individuals who completed the initial survey. Three months was chosen as the delay between the baseline and the follow-up surveys to be consistent with other longitudinal studies of help-seeking (Demyan & Anderson, 2012; Hammer & Spiker, 2018; Hammer & Vogel, 2013). The follow-up survey asked participants to complete the same measures that were included in the initial survey. In addition, they were asked to report on their use of psychotherapy in the past 3 months.

Measures

Patient Health Questionnaire-9

The PHQ-9 (Kroenke et al., 2001; see Appendix B) is a nine-item measure of depression symptom severity. Items correspond to the diagnostic criteria for Major Depressive Disorder

(MDD) in the Diagnostic and Statistical Manual of Mental Disorders-Fifth Edition (American Psychiatric Association, 2013). Participants rate the frequency with which they have experienced each symptom on a scale of 0 (*not at all*) to 3 (*nearly every day*) in the past 2 weeks. An additional question, which is not included in the total score, asks participants to rate the amount of functional impairment resulting from the symptoms they endorse. Possible total scores (found by summing the nine individual item scores) range from 0 to 27, with higher scores indicating higher severity of depression symptoms. Total scores of 10 or higher have been found to have very good specificity and sensitivity (88% for both) in identifying individuals who meet criteria for a depressive disorder as determined through structured clinical interviews (Kroenke et al., 2001). The PHQ-9 is also positively associated with measures of general distress (e.g., Medical Outcomes Study Short-Form General Health Survey; $r = .73$) and functional impairment ($r = .53$), has demonstrated good internal consistency ($\alpha = .89$) and 2-day test-retest reliability ($r = .84$), and is reliable across paper and online administrations ($r = .92$; Erbe et al., 2016; Kroenke et al., 2001). Internal consistency in the current study was $\alpha = .70$.

Gains and Losses Related to Seeking Psychotherapy

Gains and losses will be measured with a 14-item questionnaire developed by Yzer et al. (2021; see Appendix C) to examine anticipated positive and negative consequences of help-seeking for depression. The measure asks participants to rate the likelihood of experiencing various treatment-related gains (e.g., getting useful advice, feeling better) and losses (e.g., feeling worse, feeling judged) on a scale of 1 (*very unlikely*) to 7 (*very likely*). Because it was originally designed for use with college students, wording of certain items will be modified to accommodate non-student participants. For example, the item referring to “keeping on track with school” will be replaced with, “keeping on track with school, work, or other important tasks”.

This measure demonstrated good internal consistency for the gains ($\alpha = .89$) and losses subscales ($\alpha = .81$); was correlated with help-seeking attitudes in the expected directions (i.e., losses were negatively correlated with positive attitudes, $r = -.21$, and gains were positively correlated with attitudes, $r = .58$); and distinguished between individuals with and without depressive symptoms (Yzer et al., 2021). In the current study, the total score of the gains subscale will represent the anticipated gains of seeking psychotherapy, and the total score of the losses subscale will represent anticipated losses of seeking psychotherapy. In the current study, internal consistency for the gains subscale was $\alpha = .90$ and $\alpha = .77$ for the losses subscale.

Sensitivity to Gains and Losses

Sensitivity to gains and losses were assessed using the Sensitivity to Punishment Sensitivity to Reward Questionnaire – Revised and Clarified (SPSRQ-RC; Torrubia et al., 2001; Conner et al., 2018). The SPSRQ-RC (see Appendix D) contains one 10-item subscale of sensitivity to rewards (e.g., “I like to compete and do everything I can to win.”) and another 10-item subscale of sensitivity to punishment (e.g., “I am easily discouraged in difficult situations.”). Participants rate the extent to which is statement is true of them on a scale of 1 (*very untrue*) to 5 (*very true*). Ratings are summed to create total scores for each subscale. The sensitivity to rewards ($\alpha = .82$) and sensitivity to punishment ($\alpha = .86$) subscales have both shown good internal consistency, were correlated with other measures of reward and punishment sensitivity in the expected directions (e.g., for punishment sensitivity and the BIS/BAS behavioral inhibition system subscale, $r = .55$; for reward sensitivity and the BIS/BAS drive subscale, $r = .39$), and showed good 8-week test-retest reliability (sensitivity to rewards $r = .82$, sensitivity to punishment $r = .86$; Conner et al., 2018). The total scores of the sensitivity to rewards and sensitivity to punishment subscales were used as the indicators of sensitivity to

gains and sensitivity to losses, respectively. Internal consistency in the current study was $\alpha = .83$ for the sensitivity to reward subscale and $\alpha = .85$ for sensitivity to punishment subscale.

Effort Required to Seek Psychotherapy

Because there were no existing measures of effort related to seeking psychotherapy, questions based on subjective effort ratings in other research areas were used (see Appendix E). In particular, single-item measures of effort are common in psychopathology research (Décombe et al., 2020; Harmon-Jones et al., 2020; Henderson et al., 2021). Based on these past measures, participants were asked to answer two questions about the overall amount of effort they anticipate seeking psychotherapy would require: (1) “How effortful would it be for you to seek psychotherapy?” and (2) “How difficult would it be for you to seek psychotherapy?” Responses to both questions were provided on scales of 1 (*not at all*) to 7 (*extremely*). To better characterize specific aspects of effort, participants were also asked to indicate their level of agreement with six statements about how emotionally, cognitively, and physically effortful or difficult seeking psychotherapy would be for them (e.g., “For me, seeking psychotherapy would be emotionally effortful.”). They also responded to these items on a scale of 1 (*strongly disagree*) to 7 (*strongly agree*). The sum of responses to all eight questions represented the effort required to seek psychotherapy. The internal consistency of the eight items was $\alpha = .82$.

Effort Discounting

Similar to past studies (Chang et al., 2020; Culbreth et al., 2018; Hofmans et al., 2020), the effort discounting measure consisted of an effort calibration task followed by questions regarding preferences for choices with various effort-reward ratios. The effort calibration task was programmed into Qualtrics with the other study measures. Participants first completed a backwards digit span procedure, which is a cognitively effortful working memory task. In this

task, participants were shown a series of numbers (e.g., a series of three numbers displayed one at a time for 2 seconds each) and then were asked to type the series into a textbox in reverse order. The task contained five levels. The first level contained 8 trials of series of two numbers, the second had 8 trials of series of three numbers, and so on until the fifth level, which had 8 trials of 6 numbers. The amount of time each number was displayed was adjusted to hold the total time of each level constant at 48 seconds. For example, numbers were displayed for 3 seconds each in the two-digit level (i.e., 6 seconds per trial for 8 trials), and this time was decreased until the 6-digit level, in which each number was displayed for only 1 second each (i.e., 6 seconds per trial for 8 trials). Thus, the difficulty or effort required to complete the task increased across levels, but the time required remained constant.

After the backwards digit span task, participants were asked a series of questions about whether they would hypothetically prefer a small monetary reward for completing an easy level of the digit span task or a larger monetary reward for completing the most difficult level of the task (e.g., “Would you prefer \$3.00 for completing the 2-digit level or \$4.00 for completing the 6-digit level?”; see Appendix F). The monetary rewards associated with completing the easier levels of the task ranged from \$0.00 to \$4.00 and were adjusted in \$0.50 increments. The reward for the 6-digit level was held constant at \$4.00. This produced an index of sensitivity to differences in the amount of effort required to obtain smaller, easier rewards versus larger, more effortful rewards. The order of the questions and the order of response options in the questionnaire were randomized to avoid framing effects. Past research with depressed samples indicates that individuals with depression can discriminate differences in reward magnitude of \$0.50 or less in behavioral decision-making tasks (Treadway et al., 2012; Yang et al., 2014). However, two validity items were included to ensure that participants were discriminating the

level of difficulty of the tasks and the differences in reward amount: (1) “Would you prefer (a) \$4.00 for completing the 2-Digit Memory Task or (b) \$4.00 for completing the 6-Digit Memory Task?” and (2) “Would you prefer (a) \$2.00 for the 6-Digit Memory Task or (b) \$4.00 for completing the 6-Digit Memory Task?” Those who failed either of the validity checks were excluded (i.e., those who chose option “b” in question one or option “a” in question two).

Indifference points were calculated based on the effort discounting questionnaire. Specifically, participants were determined to have switched their preference from the smaller, less effortful reward to the larger, more effortful reward after two consecutive choices for the larger reward (Rachlin et al., 1991). The resulting indifference points were used to calculate an Area Under the Curve (AUC) value for each participant, which served as the primary indicator of effort discounting. A hyperbolic discounting rate for each participant was also calculated from these indifference points and used as a supplementary measure of effort discounting.

Help-Seeking Intentions

Intentions to seek mental healthcare were measured with the 3-item Mental Help-Seeking Intention Scale (MHSIS; Hammer & Spiker, 2018; see Appendix G). Items inquire into participants’ predictions of whether they would seek help if they had a mental health concern (e.g., “If I had a mental health concern, I would intend to seek help from a mental health professional”). Responses are given on a scale of 1 (*definitely false*) to 7 (*definitely true*). Possible scores range from 3 to 21, with higher scores reflecting stronger intentions to seek help. The MHSIS has excellent internal consistency ($\alpha = .95$; Hammer et al., 2019) and has demonstrated good prospective classification accuracy for seeking mental healthcare within 3 months in a general population sample (69.7% accuracy; Hammer & Spiker, 2018), indicating that it is a valid and reliable measure of help-seeking intentions. The sum of the three MHSIS

items were used to represent help-seeking intentions. The measure's internal consistency was $\alpha = .94$ in the current study.

Help-Seeking

Participants were asked whether they had received professional mental healthcare in the past and if so, what type (i.e., medication or psychotherapy) and from what kind of provider (e.g., psychologist, physician; see Appendix H). If applicable, they were also asked to report on the length of time they received treatment and how long ago they discontinued treatment. Additionally, they were asked to report on their past use of other types of mental health treatments, including informal help-seeking, their interest in seeking mental healthcare, and any barriers that precluded help-seeking (e.g., financial barriers).

Demographics, COVID-19, and Survey Termination

Participants were asked to indicate their age, gender identity, sexual orientation, race and ethnicity, type of location in which they resided (e.g., rural, urban), education level, university student status (student versus non-student) and financial class (see Appendix I). Then, they were asked whether they or someone close to them have been diagnosed with COVID-19 (see Appendix J) and if so, to provide follow-up information (e.g., degree of recovery from COVID-19); a dichotomous variable representing personal COVID-19 diagnosis (yes/no) was included as a covariate in the main analyses. Afterward, they were shown the link to the therapist locator tool as described previously.

Follow-Up Survey

At the 3-month follow-up, participants were asked to again complete all measures from the baseline survey (e.g., PHQ-9, effort discounting) and report on their formal and informal help-seeking in the past 3 months. For the help-seeking questions, they answered similar

questions as in the past help-seeking questionnaire in the initial survey, but wording was changed to ask only about the past 3 months (see Appendix K). In particular, a dichotomous question asking whether they sought psychotherapy during the follow-up period (yes/no) constituted the help-seeking dependent variable. They were asked to respond to report on the top reason that they did or did not seek psychotherapy in the 3-month follow-up period. Further, they were asked a 7-point Likert-type question about the extent to which effort affected their decision to seek or not seek psychotherapy during the follow-up.

Data Analysis

Data Quality

To maximize data quality, attention check questions were included, response patterns were inspected visually, and the time each participant spent on the survey was tracked. Those who failed any attention checks were excluded from the analyses. In addition, those who demonstrated atypical responding (i.e., selecting the most positive or most negative options for all questions) were excluded. Further, those who did not spend enough time taking the survey to respond to all questions were excluded (i.e., those whose completion time indicates spending less than 2 seconds per question, or 10 minutes total).

In cases in which a measure was partially completed, the missing values for individual items were imputed with each participant's mean score on the measure (i.e., replaced with the individual participant's mean score, rather than with the group mean). Missing data on entire measures were accounted for through Full Information Maximum Likelihood (FIML) in Mplus to minimize bias. This procedure assumes that data are Missing At Random (MAR), or that missingness depends only on observed data and not on the missing data values themselves (Enders, 2010). For example, if attrition is completely accounted for by variables measured at

baseline, such as participants with higher baseline depression scores being less likely to complete the follow-up, then the data would be MAR. On the other hand, if missingness is due to unobserved variables, the data would be Missing Not At Random (MNAR). For instance, this would be the case if those who did not seek help during the follow-up were more likely to drop out of the study. Although we cannot definitively determine that data are MAR, we believe that a MAR data pattern is likely because access to and incentives to complete the follow-up survey were independent of help-seeking (e.g., participants could complete the survey in their homes rather than being required to come to a clinic). Additionally, FIML is among the most robust methods of handling missing data even if MAR assumptions are violated (Baraldi & Enders, 2010). Finally, FIML allows for preserving statistical power even if there is significant attrition.

In terms of normality assumptions, it was anticipated that some variables, such as depressive symptom severity, would be non-normally distributed. Data was visually inspected for normality, and z-tests were conducted to determine whether there was significant skewness and kurtosis. When violations were observed, these were reported and the non-normal variables were transformed (e.g., exponential and logarithmic transformations). For cases in which normality was not improved by the transformations, non-transformed variables were used in the analyses.

Data Analysis Plan

All hypotheses in the proposed study were tested using path analysis in Mplus. This approach allows for testing individual associations between variables within the context of the full theoretical model (i.e., controlling for all other variables in the model), which provides a holistic representation of the multiple behavioral processes associated with help-seeking and how they interact. In addition, this approach allows for testing alternative theoretical models and

comparing the goodness of fit of these alternatives against the hypothesized model. For example, if poor fit is found with the hypothesized model, alternative associations among variables could be explored to identify potentially superior iterations.

Because the hypothesized model only included observed variables, the path analysis was conducted in one step. Specifically, the structural model included eight observed variables: depressive symptom severity, gains of seeking psychotherapy, losses of seeking psychotherapy, sensitivity to gains, sensitivity to losses, effort required to seek psychotherapy, effort discounting, and help-seeking at the 3-month follow-up. In the model predicting intentions to seek psychotherapy, the help-seeking variable was replaced with help-seeking intentions at the 3-month follow-up. As previously discussed, total scores of most measures, such as the PHQ-9 and the measure of gains and losses of help-seeking, were used to represent observed variables in most cases. AUC values calculated from the effort discounting questionnaire were used as the primary indicator of effort discounting; *I* values were used as a supplementary effort discounting indicator.

Goodness-of-fit of the structural model was established based on several criteria. Specifically, good model fit was demonstrated by a non-significant chi-square goodness-of-fit test or when $\chi^2/df < 2$, a Root Mean Square Error of Approximation (RMSEA) of .06 or below, a Comparative Fit Index (CFI) of .95 or above, and a Tucker-Lewis Index (TLI) of .95 or above (Hu & Bentler, 1999; Schumacker & Lomax, 2016). In order to rule out the possibility that help-seeking or changes in help-seeking intentions at the follow-up were due to changes in baseline variables, we tested whether depression symptom severity, gains and losses of seeking psychotherapy, sensitivity to gains and losses, effort, and effort discounting measured at the 3-month follow-up were associated with seeking psychotherapy and help-seeking intentions.

Significant correlates were included as covariates in addition to COVID-19 diagnosis at baseline (not pictured in Figure 1).

Hypothesis 1

Hypothesized relationships in the structural model are shown in Figure 1. The first hypothesis was that depressive symptoms would be positively associated with the anticipated losses of seeking psychotherapy and sensitivity to losses, negatively associated with the anticipated gains of seeking psychotherapy and sensitivity to gains, and positively associated with the anticipated effort required to seek psychotherapy and effort discounting. To test this hypothesis, the gains, losses, and effort of seeking psychotherapy; participants' sensitivity to gains and losses; and effort discounting were regressed on depressive symptoms in the structural model.

Hypothesis 2

The second hypothesis was that the anticipated gains, losses, and effort of seeking psychotherapy would prospectively predict help-seeking and help-seeking intentions at a 3-month follow-up. Sensitivity to gains, losses, and effort (i.e., effort discounting), respectively, were hypothesized to moderate these effects. All variables were mean-centered to prevent multicollinearity among individual predictors and interaction terms. For instance, in testing the interaction of effort and effort discounting, both variables were first mean-centered, and the two resulting variables were multiplied together to create the interaction term. To test this second hypothesis, the dichotomous help-seeking variable at the 3-month follow-up (or the help-seeking intentions variable) was regressed on the anticipated gains, losses, and effort of seeking psychotherapy; sensitivity to gains, sensitivity to losses, and effort discounting; and the three

interaction terms (gains*sensitivity to gains, losses*sensitivity to losses, effort*effort discounting).

Chapter 4: Results

A total of 2,033 individuals completed the study screening. Of these, 1,366 (67.2%) were excluded because they did not endorse moderate to severe depression symptoms on the PHQ-9, 274 (13.5%) were excluded because they reported they were currently receiving psychotherapy, 27 (1.3%) indicated they were unwilling to complete the 3-month follow-up, 5 (0.2%) declined to consent to participate in the study, 38 (1.9%) failed one or more attention checks after consenting, and 70 (3.4%) failed one or both of the effort discounting validity checks. The final sample included 253 participants at baseline, 91 (36.0%) of which completed the 3-month follow-up. The full sample identified primarily as White, female, and college educated. Almost one third reported previous psychotherapy use. Demographic and clinical characteristics are shown in Tables 1 and 2, respectively.

Table 1

Sample demographic characteristics

Variable	%	Variable	%
Age ($M[SD]$)	33.6(11.1)	Race and Ethnicity	
Gender		Non-Hispanic White	73.5
Female	71.9	Hispanic	12.6
Male	24.1	Black/African American	7.5
Non-Binary	2.4	Latino/a/x	5.5
Transgender Male	1.2	Asian	4.7
Other	0.4	Mixed Race	4.7
Sexual Orientation		Native American	1.6
Heterosexual	64.0	Native Hawaiian/Pacific Islander	1.2
Bisexual	19.0	Other	1.2
Pansexual	5.1	Education	
Asexual	4.0	Some high school or less	2.4
Gay	3.2	High school diploma/GED	16.6
Lesbian	2.0	Professional Certification	4.3

Variable	%	Variable	%
Other	2.8	Some College	28.9
Area of Residence		Associate's Degree	11.9
Suburban	34.8	Bachelor's Degree	25.3
Urban	24.5	Graduate Degree	10.7
Small Town	19.0	Self-Reported Socioeconomic Status	
Rural	21.7	Lower Class	37.2
		Lower-Middle Class	36.4
		Middle Class	21.7
		Upper-Middle Class	4.7

Table 2*Sample clinical characteristics*

Variable	%
Psychotherapy Use	
Currently Receiving Psychotherapy	0
Received Psychotherapy in the Past	30.9
Length of Past Psychotherapy in Months ($M[SD]$)	7.34(1.7)
Months Since Psychotherapy Termination ($M[SD]$)	57.3(58.6)
Pharmacotherapy Use	
Currently Receiving Pharmacotherapy	20.6
Received Pharmacotherapy in the Past	31.2
Length of Past or Current Pharmacotherapy in Months ($M[SD]$)	6.9(1.8)
Other Mental Healthcare Use	4.0
No Past or Current Mental Healthcare Use	31.2
Self-Reported Barriers to Receiving Mental Healthcare	
Too Expensive	57.5
Too Much Effort	26.5
Lack of Insurance Coverage	25.3
Mental Health Problems Interfere with Appointments	24.5
Not Enough Time	22.1
Beliefs that Treatment Will Not Work	20.2
Difficulty Finding a Provider	17.8
Worries About What Others Will Think	14.6
Concerns About Confidentiality	9.9

Variable	%
Unsure if Treatment Is Needed	7.5
COVID-19	
Diagnosed with COVID-19	17.0
Hospitalized for COVID-19	1.6
Degree of Recovery from COVID-19 (participants with COVID-19 diagnosis only)	
Full Recovery	62.8
Partial Recovery	30.2
No Recovery	7.0
Significant Other Diagnosed with COVID-19	48.6

Data Quality

Missing data was minimal in the baseline variables (0.1%). Missing data for those who completed the 3-month follow-up survey was also minimal (3.2%). However, the overall rate of missing data in the follow-up survey was substantial because of attrition (64.0%). Participants who completed the follow-up survey tended to be older ($t[250] = 3.97, p < .001, d = 0.57$) and to report higher sensitivity to gains ($t[250] = 2.29, p = .023, d = 0.30$) and lower depression symptoms at baseline ($t[250] = 3.97, p = .005, d = 0.37$). No other significant differences in study variables or demographic characteristics were observed between those who completed the follow-up survey and those who dropped out.

As expected, baseline PHQ-9 scores were significantly positively skewed ($z = 4.56, p < .001$; kurtosis, $z = 0.44, p = .660$). The effort discounting parameter l was also highly non-normal at baseline ($z = 49.96, p < .001$; kurtosis, $z = 189.16, p < .001$) and at the 3-month follow-up ($z = 34.18, p < .001$; kurtosis, $z = 157.28, p < .001$). The gains of seeking psychotherapy variable was also negatively skewed at baseline ($z = 3.08, p = .002$; kurtosis, $z = 0.42, p = .674$) and at the 3-month follow-up ($z = 2.54, p = .011$; kurtosis, $z = 0.42, p = .674$). Additionally, losses of seeking psychotherapy at baseline showed significant kurtosis ($z = 2.60, p = .009$;

skewness, $z = 0.07, p = .944$), and baseline total effort required to seek psychotherapy was non-normal (skewness, $z = 3.13, p = .002$; kurtosis, $z = 2.26, p = .024$). Further, the sensitivity to punishment subscale of the SPSR-RC was non-normal at baseline (skewness, $z = 5.09, p < .001$; kurtosis, $z = 2.23, p = .026$) and at the follow-up (skewness, $z = 6.87, p < .001$; kurtosis, $z = 2.18, p = .029$). Similarly, the SPSR-RC sensitivity to reward subscale was positively skewed at baseline ($z = 3.14, p = .002$; kurtosis, $z = 1.52, p = .129$) and at the follow-up ($z = 4.34, p < .001$; kurtosis, $z = 1.22, p = .222$). Moreover, AUC values were non-normal at baseline (skewness, $z = 4.72, p < .001$; kurtosis, $z = 2.21, p = .027$) and at the follow-up (skewness, $z = 2.50, p = .012$; kurtosis, $z = 1.59, p = .112$). Finally, kurtosis for help-seeking intentions at baseline was significantly non-normal ($z = 2.27, p = .023$; skewness, $z = 0.35, p = .726$). Tests of skewness and kurtosis were non-significant at the 3-month follow-up for help-seeking intentions (skewness, $z = 0.45, p = .653$; kurtosis, $z = 1.67, p = .095$) and PHQ-9 scores (skewness, $z = 0.47, p = .638$; kurtosis, $z = 1.08, p = .280$).

Logarithmic, exponential, and inverse transformations were conducted for all non-normally distributed variables. The logarithmic transformation improved normality for the discounting parameter l at baseline ($z = 6.42, p < .001$; kurtosis, $z = 3.39, p = .001$) and at the follow-up ($z = 3.21, p = .001$; kurtosis, $z = 1.23, p = .219$), and so transformed scores for this variable were used in the analyses. However, transformations did not improve normality for any other variable. As such, non-transformed scores for all other variables were used in the main analyses. Results should be interpreted with this limitation in mind.

In addition to testing normality assumptions, effort discounting data was examined to determine whether participants engaged in discounting during the task. Specifically, Johnson and Bickel (2008) proposed an algorithm for identifying participants who make unpredictable

patterns of decisions in discounting tasks (i.e., nonsystematic responding). This algorithm flags participants if (1) any indifference point is at least 20% larger than the previous one or (2) the last indifference point is not at least 10% less than the first indifference point. Violating the first condition suggests that the subjective value of rewards increases as differences in the amount of effort required increase, which is the opposite of what is expected if participants are engaging in discounting. Violating the second condition indicates that the amount of difference in effort between reward options has no bearing on subjective values, which is also inconsistent with discounting. Past findings indicate that in studies of delay and probability discounting, approximately 18-19% of participants violate one or both of these criteria (Smith et al., 2018). However, rates of nonsystematic responding have been found to be as high as 60% in delay discounting tasks among MTurk workers with Alcohol Use Disorder (Craft et al., 2022). When Johnson and Bickel's (2008) algorithm was applied to effort discounting data in the current study, 53.0% violated one or both criteria; frequencies of violations of each criteria are shown in Table 3. As such, the main analyses were conducted twice: once with all participants, and once with only participants who provided systematic effort discounting data (47% of the total sample).

Table 3*Patterns of violations of Johnson and Bickel's (2008) conditions for systematic discounting*

Condition One				
Condition Two		Satisfied	Violated	Total:
	Satisfied	118	14	132
	Violated	112	7	119
	Total:	230	21	

Note. A violation of condition one indicates that an indifference point was at least 20% larger than the one before it. A violation of condition two indicates that that last indifference point was not at least 10% less than the first indifference point.

Preliminary Analyses

First, we conducted zero-order, bivariate correlations between continuous study variables measured at baseline. This allowed for exploring individual associations of behavioral economic predictors with psychotherapy use and help-seeking intentions. Results are displayed in Table 4. Briefly, depression symptom severity was positively correlated with the anticipated losses of seeking psychotherapy, sensitivity to losses, and the amount of effort required to seek psychotherapy; it was not significantly correlated with the anticipated gains of seeking psychotherapy or effort discounting. The gains and losses of seeking psychotherapy, as well as the effort required to seek psychotherapy, were significantly correlated with help-seeking intentions in the expected directions.

We also conducted correlations between baseline variables and help-seeking intentions at the follow-up (see Table 4). Only gains, losses, and intentions at baseline were significantly

correlated with help-seeking intentions at the 3-month follow-up. Correlations among all variables at baseline and the follow-up are shown in Appendix L.

Last, we ran point-biserial correlations between having attended psychotherapy during the follow-up (yes/no) and the main study variables at baseline (see Table 4). Only 10 of the 91 participants who completed the follow-up survey reported receiving psychotherapy during the follow-up period, and so results that include the help-seeking variable should be interpreted with caution. Only the anticipated losses associated with seeking psychotherapy were significantly correlated with having attended psychotherapy during the follow-up. The amount of effort required to seek psychotherapy was just above the cutoff for significance.

Table 4

Zero-order correlations among baseline predictors and help-seeking variables at the 3-month follow-up (continued on next page)

Variable	<i>M</i> (<i>SD</i>)	Gains	Losses	Effort	SPSRQ-RC: SR	SPSRQ-RC: SP	AUC
PHQ-9	15.50(4.21)	.04	.20**	.19**	.03	.31**	.09
Gains	4.67(1.27)		-.44**	-.11	.11	.01	.01
Losses	3.89(1.25)			.45**	.10	.25**	-.07
Effort	4.75(1.15)				-.03	.28**	-.02
SPSRQ-RC: SR	2.42(0.74)					-.14*	.19**
SPSRQ-RC: SP	3.86(0.73)						-.00

Note. PHQ-9: Patient Health Questionnaire-9, SPSRQ-RC: SR: Sensitivity to Punishment

Sensitivity to Reward Questionnaire – Revised and Clarified: Sensitivity to Reward subscale,

SPSRQ-RC: SP: Sensitivity to Punishment Sensitivity to Reward Questionnaire – Revised and

Clarified: Sensitivity to Punishment subscale, AUC: Effort Discounting Area Under the Curve,

MHSIS: Mental Help-Seeking Intention Scale.

[†] $p < .10$, * $p < .05$, and ** $p < .01$.

Zero-order correlations among baseline predictors and help-seeking variables at the 3-month follow-up (continued)

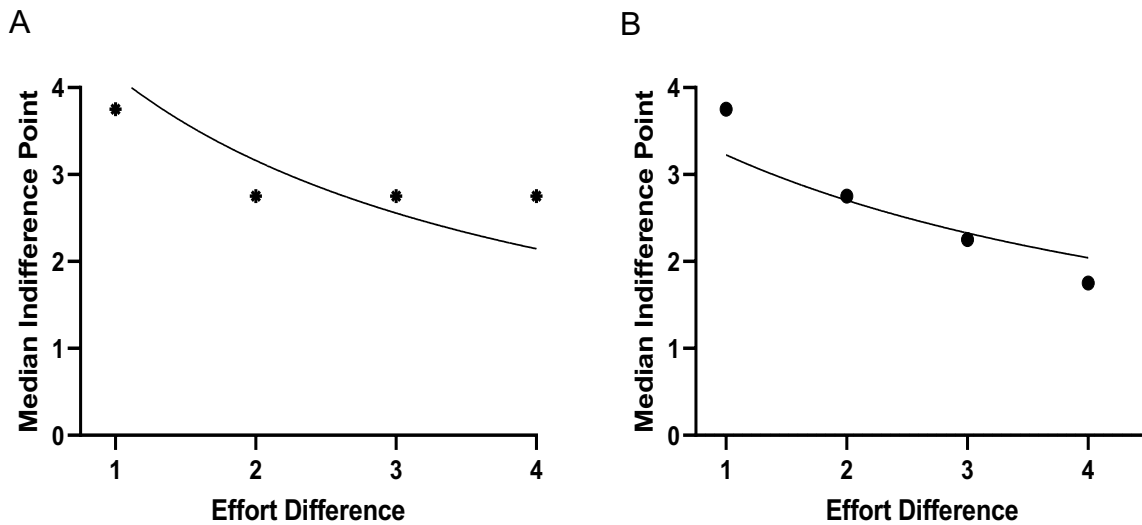
Variable	<i>M(SD)</i>	MHSIS (Time 1)	MHSIS (Time 2)	Psychotherapy Use (Time 2)
PHQ-9	15.50(4.21)	-.04	-.07	-.18 [†]
Gains	4.67(1.27)	.45**	.38**	-.03
Losses	3.89(1.25)	-.42**	-.33**	-.30**
Effort	4.75(1.15)	-.13*	-.15	-.19 [†]
SPSRQ-RC: SR	2.42(0.74)	.11 [†]	.09	-.08
SPSRQ-RC: SP	3.86(0.73)	-.17*	.05	-.12
AUC	0.47(0.22)	.00	.04	-.16
MHSIS (Time 1)	3.98(1.61)		.65**	-.01
MHSIS (Time 2)	3.99(1.76)			-.26*

Exploratory analyses were also conducted to determine whether participants' effort discounting data were consistent with the hyperbolic function that has been found in past research (Garamia & Moustafa, 2021). As previously described, indifference points from the effort discounting questionnaire were used to determine each participant's discounting rate. Then, the median of these indifference points was calculated. Afterward, a hyperbolic curve was fit to these median indifference points to calculate the effort discounting parameter l at the group level (see Equation 1). This was done with the full sample and again with only the participants who provided systematic data as defined by the Johnson and Bickel (2008) algorithm. Results of these analyses are shown in Figure 2. For the full sample, the hyperbolic function was a poor fit to the data, $R^2 = .03$, $k = .45$ (see Panel A of Figure 2). However, it was a good fit to the subsample that provided systematic discounting data, $R^2 = .83$, $k = .24$ (see Panel B of Figure 2). As such, for those who responded systematically, the effort discounting questionnaire produced results that were consistent with past findings on hyperbolic effort discounting. Specifically, as

the magnitude of the difference in effort between the easier and harder cognitive tasks increased, the difference had progressively less effect on the subjective value of the monetary reward. In other words, once the difference in cognitive effort between two options was sufficiently large, increasing the size of that difference had a progressively smaller effect on individuals' choices.

Figure 2

Fit of effort discounting data with a hyperbolic function



Note. Panel A shows effort discounting data from the full sample. Panel B only shows effort discounting data from participants who responded systematically on the effort discounting questionnaire.

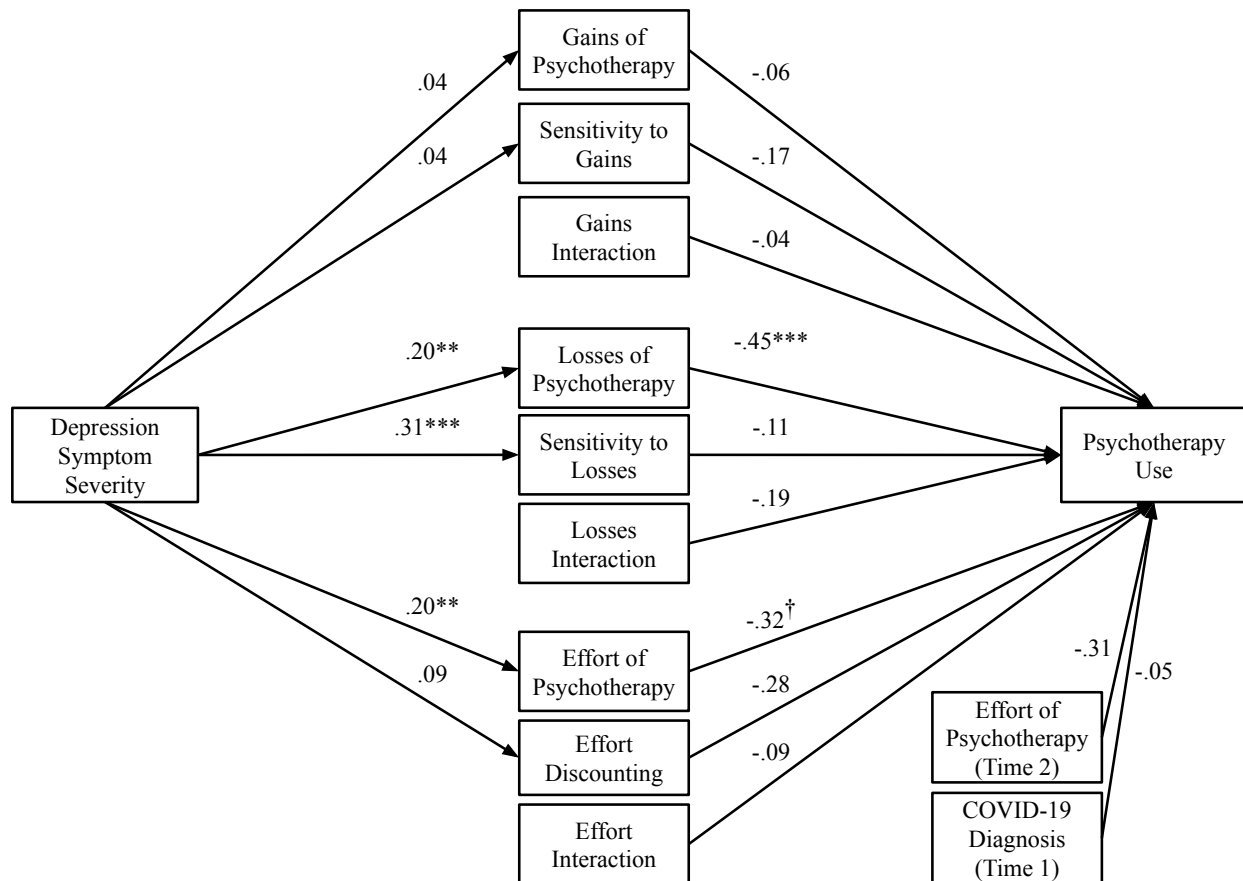
Before conducting the main analyses, relationships among proposed covariates and the dependent variables were tested. Specifically, we tested whether a COVID-19 diagnosis at baseline and predictors measured at the follow-up (e.g., gains, sensitivity to gains) were correlated with seeking psychotherapy and help-seeking intentions at the follow-up. The amount of effort required to seek psychotherapy at the follow-up ($r[87] = -.24, p = .027$) and a COVID-19 diagnosis at baseline ($\chi^2(1) = 5.12, p = .024$) were significantly associated with having received psychotherapy during the follow-up period. As such, these were included as covariates in the models predicting psychotherapy use. Additionally, the gains of seeking psychotherapy at follow-up ($r[82] = .57, p < .001$), the losses of seeking psychotherapy at follow-up ($r[82] = -.37, p < .001$), and sensitivity to gains at follow-up ($r[82] = .22, p = .044$) were correlated with help-

seeking intentions at the follow-up. These variables were included as covariates in the models predicting intentions. Covariates were included in models predicting psychotherapy use and intentions to rule out the possibility that a COVID-19 diagnosis or predictors at the follow-up accounted for any associations of baseline predictors with help-seeking variables. For instance, the fact that the effect of the losses of psychotherapy at the follow-up were associated with help-seeking intentions could indicate that the change in losses over time affects intentions. Controlling for losses at the follow-up ensured that a significant effect of losses at baseline could be interpreted as losses having a long-term, prospective effect on intentions.

Main Analyses

Psychotherapy Use

After identifying significant covariates, we tested the hypothesized model predicting psychotherapy use. As previously noted, only 10 participants reported receiving psychotherapy. Because of this, results of analyses that include the seeking psychotherapy variable (rather than help-seeking intentions) should be interpreted with caution. The full model (see Figure 2) was non-significant, $p = .090$, though it accounted for 60% of the variance in seeking psychotherapy. The model was also a poor fit to the data: $\chi^2(51) = 244.45$, $p < .001$, $\chi^2/df = 4.79$; RMSEA = .12, CFI = .09, TLI = -.39. Consistent with Hypothesis 1, depression symptom severity positively predicted losses, sensitivity to losses, and effort. However, depression symptom severity did not significantly predict gains, sensitivity to gains, or effort discounting. Consistent with Hypothesis 2, losses negatively predicted psychotherapy use. The path from effort to psychotherapy use was nearly significant, but no other variables significantly predicted psychotherapy use. Correlations among exogenous variables were also estimated and are shown in Appendix M.

Figure 3*Full model predicting psychotherapy use*

Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

Related to Hypothesis 1, depression symptom severity positively predicted losses, sensitivity to losses, and effort; but it did not predict gains, sensitivity to gains, or effort discounting. Related to Hypothesis 2, losses negatively predicted psychotherapy use, but no other variables predicted psychotherapy use. The model was a poor fit to the data: $\chi^2(51) = 244.45, p < .001, \chi^2/df = 4.79$;

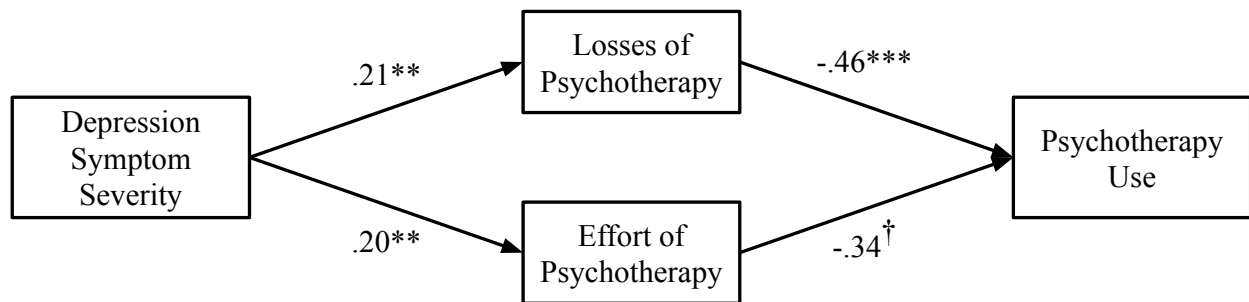
RMSEA = .12, CFI = .09, TLI = -.39

[†] $p < .10$, * $p < .05$, and ** $p < .01$.

Due to the poor model fit, we ran the model again without the non-significant paths. As an exception, we kept the effort variable to test whether it would significantly predict psychotherapy use after removing other non-significant predictors. The modified model (see Figure 3) accounted for a non-significant portion of the variance in psychotherapy use ($R^2 = .35$, $p = .138$) and was still a poor fit to the data: $\chi^2(2) = 37.54$, $p < .001$; $\chi^2/\text{df} = 18.77$; RMSEA = .27; CFI = .38; TLI = -.87. Consistent with Hypothesis 1, depression symptom severity predicted losses and effort. Consistent with Hypothesis 2, losses predicted psychotherapy use. However, the path from effort to psychotherapy use was still above the cutoff for significance.

Figure 4

Modified model predicting psychotherapy use



Note. Numbers are standardized betas. The model was a poor fit to the data: $\chi^2(2) = 37.54$, $p < .001$; $\chi^2/\text{df} = 18.77$; RMSEA = .27; CFI = .38; TLI = -.87.

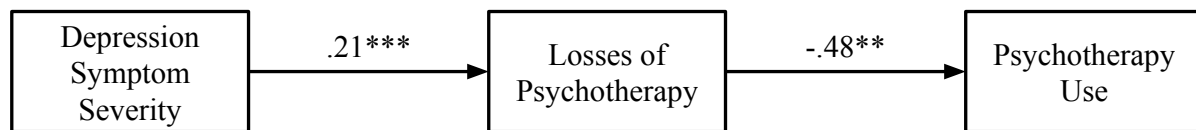
† $p < .10$, * $p < .05$, and ** $p < .01$.

We ran the model once more without the effort variable. This model (see Figure 4) accounted for a non-significant portion of the variance in psychotherapy use, $R^2 = .23$, $p = .086$. However, it was a good fit to the data: $\chi^2(1) = 1.29$, $p = .257$; RMSEA = .03; CFI = .99, TLI = .96. This suggests that the non-significant R^2 value may be due to insufficient statistical power

to test a just-identified model. Consistent with Hypothesis 1, depression symptom severity significantly and positively predicted losses. Consistent with Hypothesis 2, losses significantly predicted a lower likelihood of psychotherapy use.

Figure 5

Final model predicting psychotherapy use



Note. Numbers are standardized betas. Consistent with Hypothesis 1, depression symptom severity positively predicted losses. Consistent with Hypothesis 2, losses negatively predicted psychotherapy use. The model was a good fit to the data: $\chi^2(1) = 1.29, p = .257$; RMSEA = .03; CFI = .99, TLI = .96

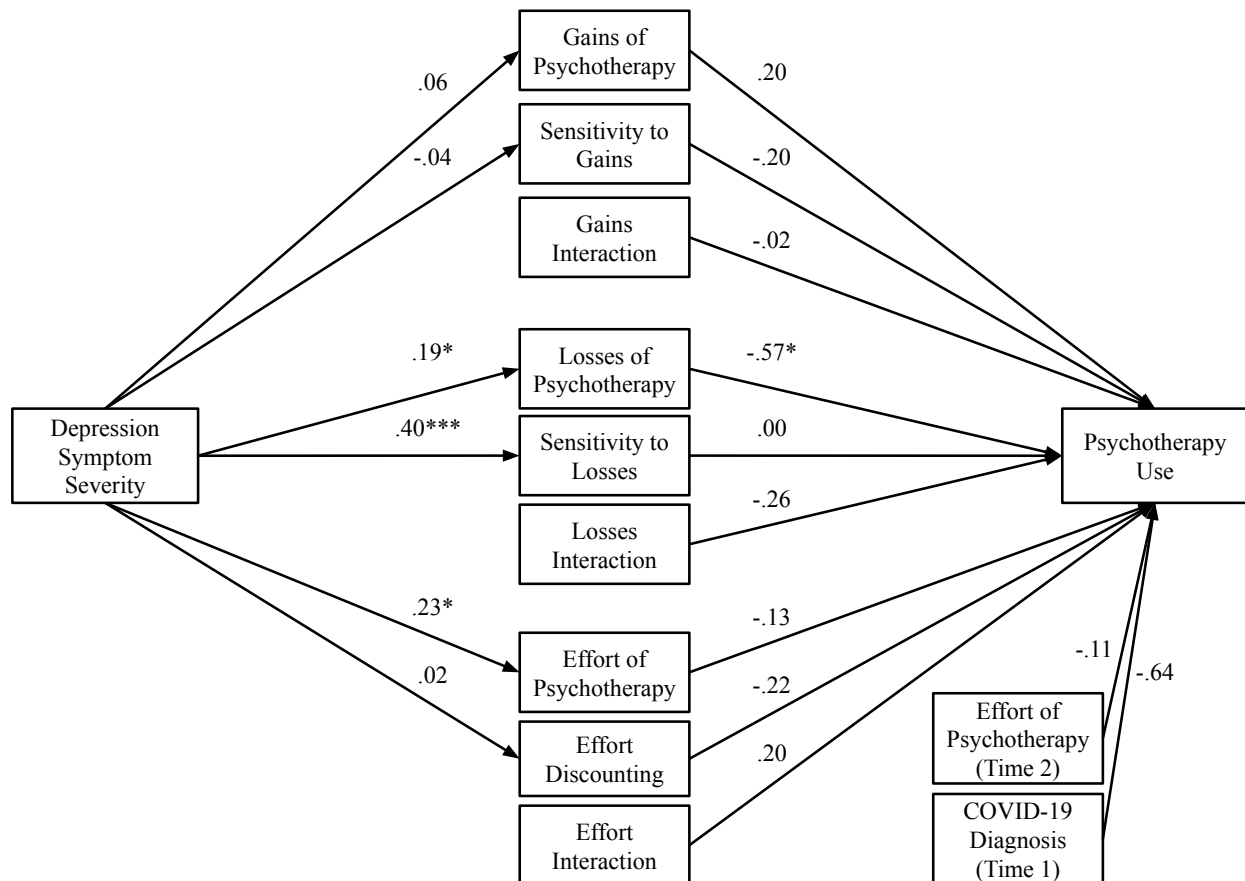
** $p < .01$, and *** $p < .001$.

We also ran the full model with only participants who responded systematically to the effort discounting questionnaire (see Figure 5). We did this to test whether effort and sensitivity to effort would be related to psychotherapy use for this subset of participants. However, the insufficient number of individuals who sought psychotherapy in this subsample likely led to a biased estimate of the variance accounted for by the model ($R^2 = .96, p = .428$), and the model was a poor model fit to the data: $\chi^2(51) = 137.21, p < .001$; $\chi^2/df = 2.69$; RMSEA = .12; CFI = .00; TLI = -.53. Additionally, effort, effort discounting, and their interaction were still non-significant predictors of psychotherapy use. Other paths in the model were unchanged from the

full model that included all participants. Correlations among exogenous variables were also estimated and are shown in Appendix N.

Figure 6

Full model predicting psychotherapy use for participants who provided systematic effort discounting data



Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

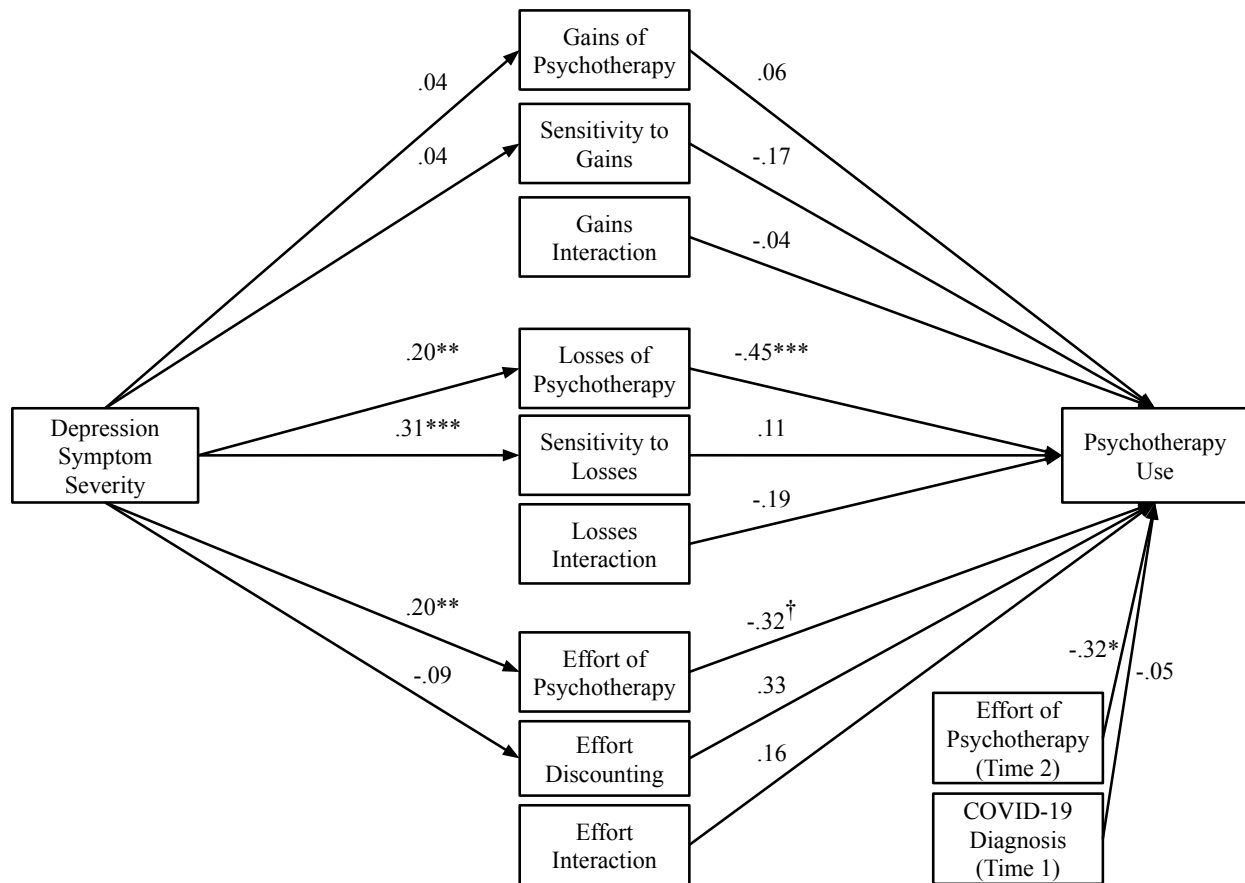
Results were unchanged from the full model with all participants (see Figure 1). The model was a poor model fit to the data: $\chi^2(51) = 137.21, p < .001$; $\chi^2/df = 2.69$; RMSEA = .12; CFI = .00; TLI = -.53

* $p < .05$, and *** $p < .001$.

To further explore potential associations of effort discounting with psychotherapy use, we ran the full model using the discounting parameter l —rather than AUC values—with the full sample. This model (see Figure 6) accounted for non-significant portion of the variance in psychotherapy use, $R^2 = .65$, $p = .108$. It was also a poor fit to the data: $\chi^2(51) = 241.52$, $p < .001$; $\chi^2/\text{df} = 4.74$; RMSEA = .12; CFI = .10; TLI = -.38. Additionally, the effects of effort, effort discounting, and the interaction of the two on psychotherapy use were still non-significant. Paths among other variables in the model were also unchanged from the model using AUC values. Correlations among exogenous variables were also estimated and are displayed in Appendix O.

Figure 7

Full model predicting psychotherapy use using the discounting parameter l



Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

Paths were unchanged from the full model with all participants (see Figure 1). The model was a poor fit to the data: $\chi^2(51) = 241.52, p < .001$; $\chi^2/df = 4.74$; RMSEA = .12; CFI = .10; TLI = -.38

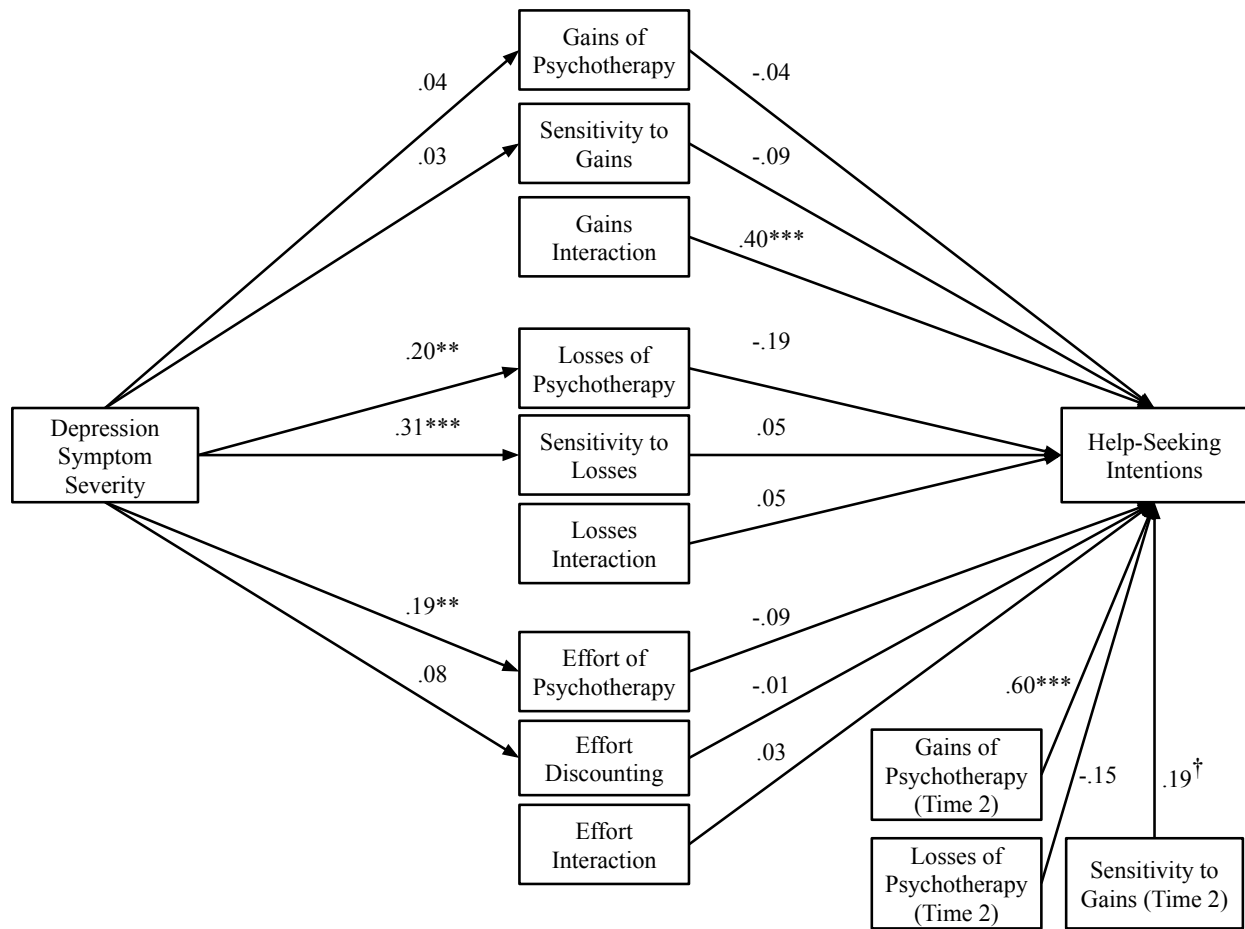
[†] $p < .10$, * $p < .05$, ** $p < .01$, and *** $p < .001$.

Taken together, these results partially support Hypothesis 1. That is, depression symptom severity significantly predicted losses in the final model, and depression symptom severity significantly predicted effort and sensitivity to losses in models that included these variables. However, depression symptom severity did not predict gains, sensitivity to gains, or effort

discounting. Partial support for Hypothesis 2 was also found: losses significantly and negatively predicted psychotherapy use in the final model, though the interaction of losses and sensitivity to losses was non-significant. The effect of effort on psychotherapy use was nearly significant, but it did not meet the threshold for significance in any model. In addition, gains, sensitivity to gains, and their interaction did not significantly predict psychotherapy use.

Help-Seeking Intentions

Next, we tested the hypothesized model predicting help-seeking intentions at the 3-month follow-up. The model was significant, $p < .001$, and it accounted for 56% of the variance in help-seeking intentions (see Figure 7). However, it was a poor fit to the data: $\chi^2(58) = 396.63$, $p < .001$, $\chi^2/df = 6.84$; RMSEA = .15, CFI = .20, TLI = .04. Consistent with Hypothesis 1, depression symptom severity significantly predicted losses, sensitivity to losses, and effort. It did not significantly predict gains, sensitivity to gains, or effort discounting, though. Consistent with Hypothesis 2, the interaction of gains and sensitivity to gains significantly predicted help-seeking intentions. However, no loss- or effort-related variables significantly predicted help-seeking intentions. Correlations among exogenous variables are shown in Appendix P.

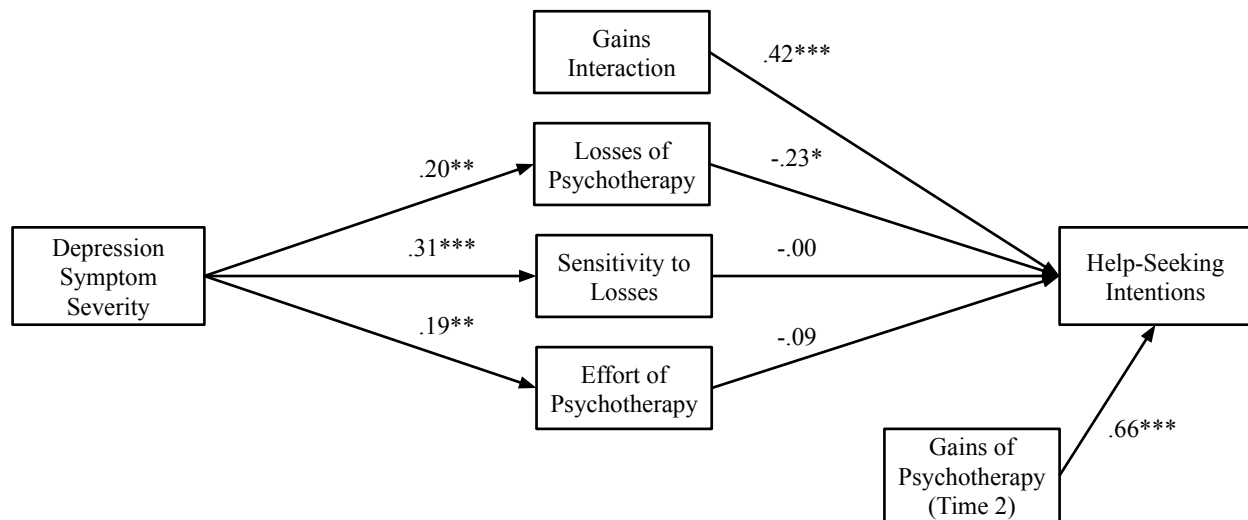
Figure 8*Full model predicting help-seeking intentions*

Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

Related to Hypothesis 1, depression symptom severity positively predicted losses, sensitivity to losses, and effort; but it did not predict gains, sensitivity to gains, or effort discounting. Related to Hypothesis 2, the interaction of gains and sensitivity to gains negatively predicted psychotherapy use, but no other variables predicted psychotherapy use. The model was a poor fit to the data: $\chi^2(58) = 396.63, p < .001, \chi^2/df = 6.84$; RMSEA = .15, CFI = .20, TLI = .04.

[†] $p < .10$, ** $p < .01$, and *** $p < .001$.

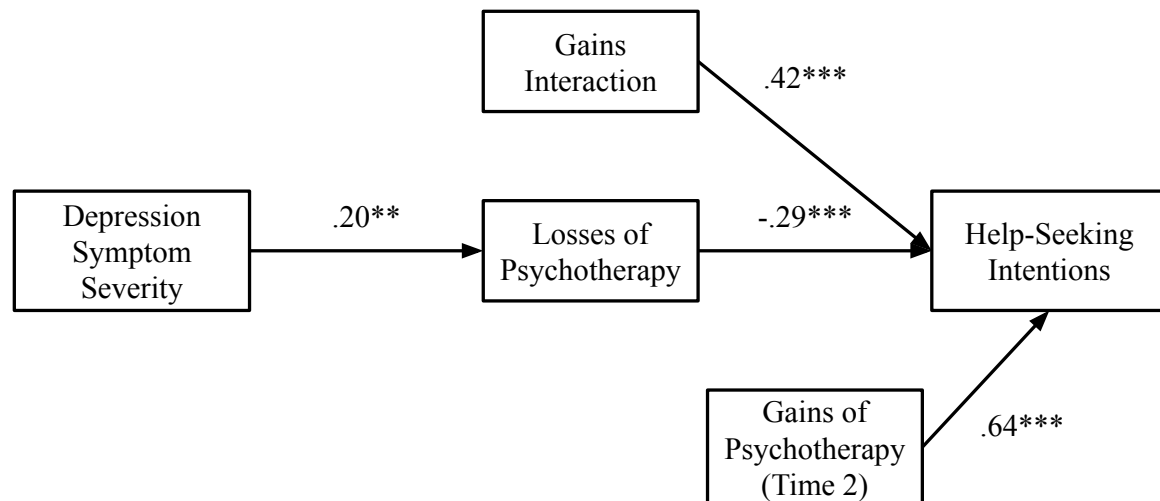
Because of the poor model fit, we ran the model again with non-significant paths omitted. However, we retained paths from losses, sensitivity to losses, and effort. We did this because of these variables' significant associations with depression symptom severity and because of their zero-order correlations with help-seeking intentions. This model was significant, $p < .001$, and it accounted for 50% of the variance in help-seeking intentions. Overall, it was still a poor fit to the data: $\chi^2(12) = 88.53$, $p < .001$, $\chi^2/df = 7.38$; RMSEA = .16, CFI = .56, TLI = .34. Consistent with Hypothesis 1, depression symptom severity still significantly predicted losses, sensitivity to losses, and effort. Consistent with Hypothesis 2, losses and the interaction of gains and sensitivity to gains significantly predicted help-seeking intentions. However, effort and sensitivity to losses did not predict help-seeking intentions.

Figure 9*Modified model predicting help-seeking intentions*

Note. Numbers are standardized betas. The correlation between gains at Time 2 and the gains interaction term was also estimated ($r = -.32, p = .001$) but is not pictured. The model was a poor fit to the data: $\chi^2(12) = 88.53, p < .001, \chi^2/df = 7.38$; RMSEA = .16, CFI = .56, TLI = .34

* $p < .05$, ** $p < .01$, and *** $p < .001$.

Based on these results, we ran the model once more with non-significant paths omitted (i.e., the paths from effort and sensitivity to losses; see Figure 9). The model was significant, $p < .001$, and it accounted for 50% of the variance in help-seeking intentions. The model fit was also acceptable: $\chi^2(5) = 9.92, p = .078, \chi^2/df = 1.98$; RMSEA = .06, CFI = .93, TLI = .90. Consistent with Hypothesis 1, depression symptom severity significantly predicted losses. Consistent with Hypothesis 2, losses and the interaction of gains and sensitivity to gains significantly predicted help-seeking intentions.

Figure 10*Final model predicting help-seeking intentions*

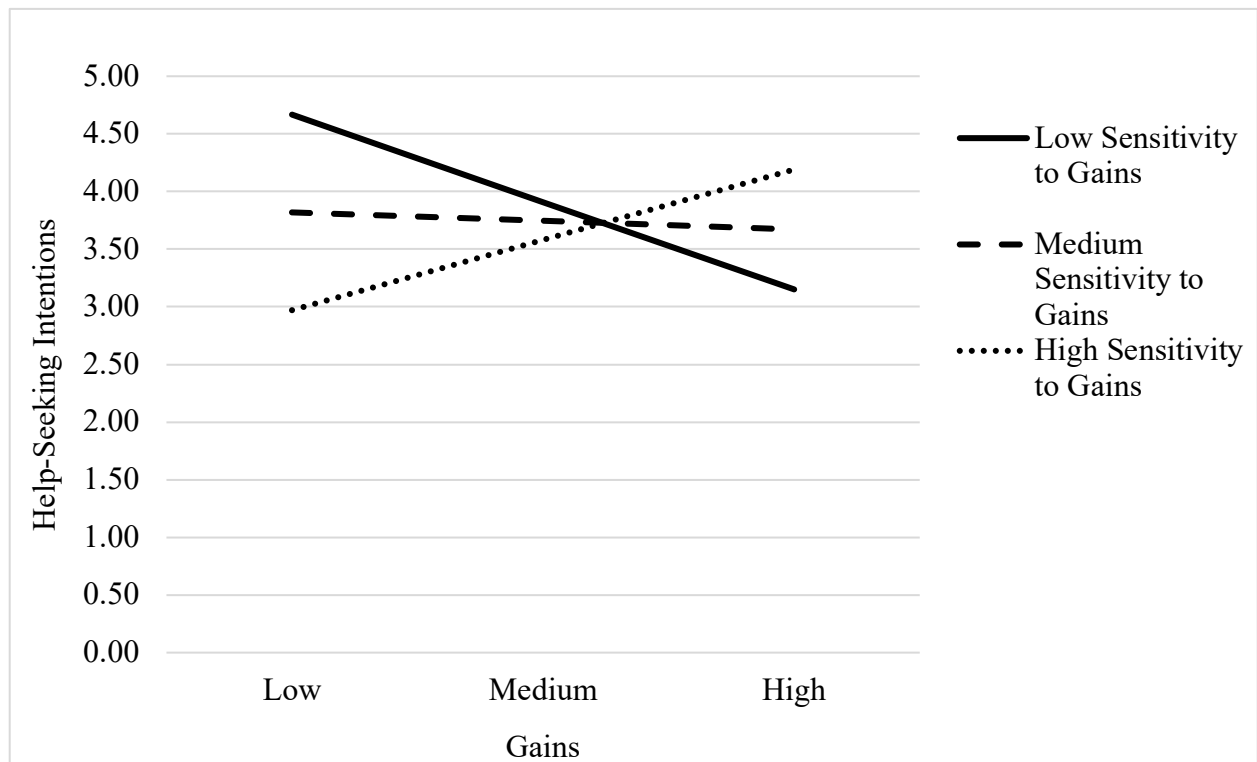
Note. Numbers are standardized betas. The correlation between gains at Time 2 and the gains interaction term was also estimated ($r = -.32, p = .001$) but is not pictured. Consistent with Hypothesis 1, depression symptom severity positively predicted losses. Consistent with Hypothesis 2, losses negatively predicted intentions, and the interaction of gains and sensitivity to gains predicted intentions. The model was an acceptable fit to the data: $\chi^2(5) = 9.92, p = .078$, $\chi^2/\text{df} = 1.98$; RMSEA = .06, CFI = .93, TLI = .90.

* $p < .05$, ** $p < .01$, and *** $p < .001$.

The interaction of gains and sensitivity to gains is illustrated in Figure 10. Higher levels of gains predicted higher help-seeking intentions for those who were high in sensitivity to effort. For those who were low in sensitivity to effort, higher anticipated gains from seeking psychotherapy were associated with lower help-seeking intentions. However, as shown in Figure 9, depression symptom severity was not associated with the level of gains that depressed individuals anticipated would result from psychotherapy or with sensitivity to gains.

Figure 11

Help-seeking intentions at various levels of gains and sensitivity to gains

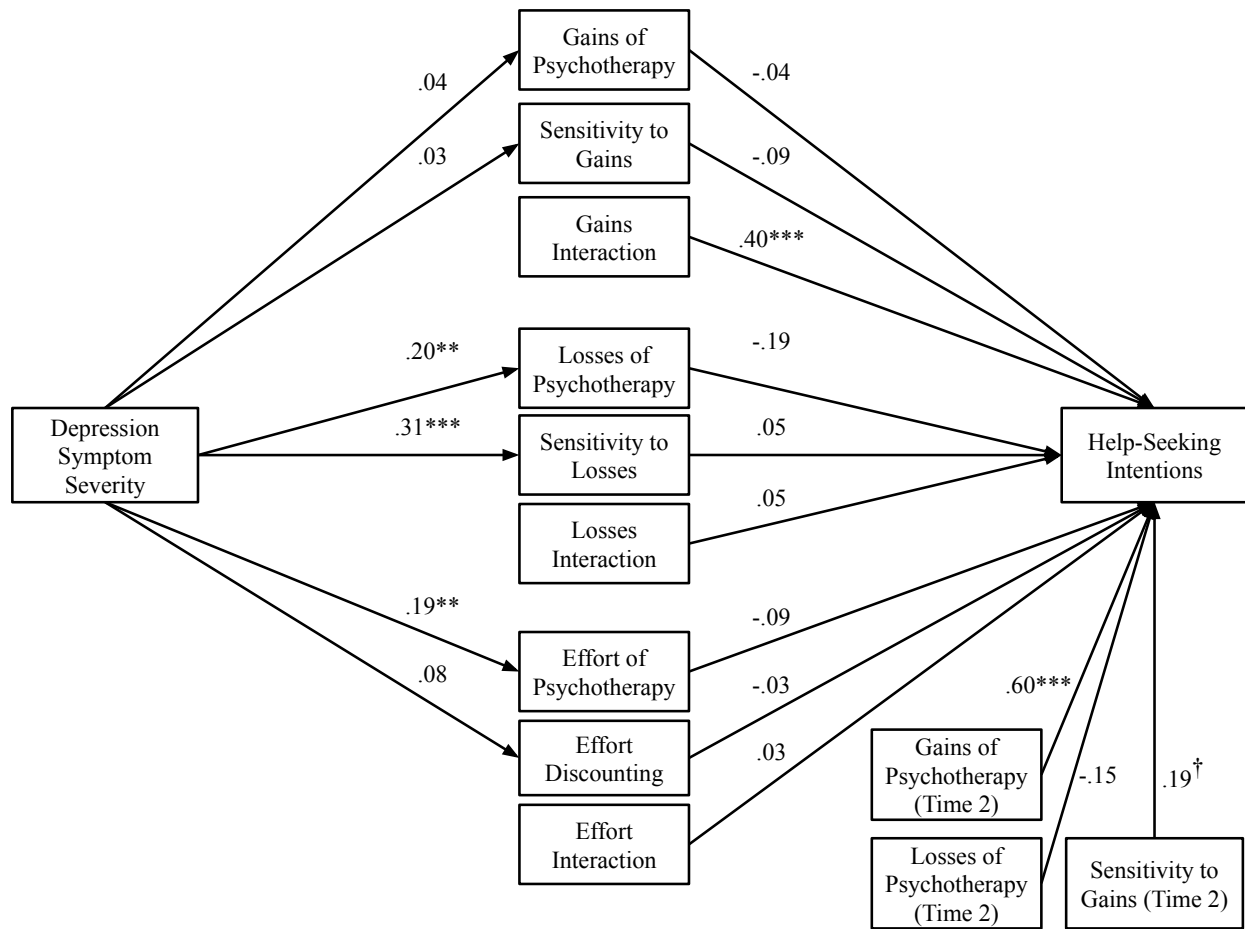


Note. Low, medium, and high values for both predictor variables are one standard deviation below the mean, the mean, and one standard deviation above the mean, respectively.

As in the case of the model predicting psychotherapy use, we ran the full model predicting intentions with the discounting parameter l rather than AUC values to further test the relationship of effort-related variables with intentions. The model accounted for a significant portion of the variance in help-seeking intentions ($R^2 = .56, p < .001$; see Figure 11), but it was a poor fit to the data: $\chi^2(58) = 398.24, p < .001$; $\chi^2/df = 6.87$; RMSEA = .15; CFI = .20; TLI = .04. Additionally, effort, effort discounting, and the interaction of the two were still non-significant. Other paths were also unchanged from the full model using AUC values (see Figure 7). Correlations among exogenous variables in the model are shown in Appendix Q.

Figure 12

Full model predicting help-seeking intentions using the effort discounting parameter l



Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

Paths were unchanged from the model using AUC values (see Figure 7). The model was a poor

fit to the data: $\chi^2(58) = 398.24, p < .001$; $\chi^2/\text{df} = 6.87$; RMSEA = .15; CFI = .20; TLI = .04.

† $p < .10$, ** $p < .01$, and *** $p < .001$.

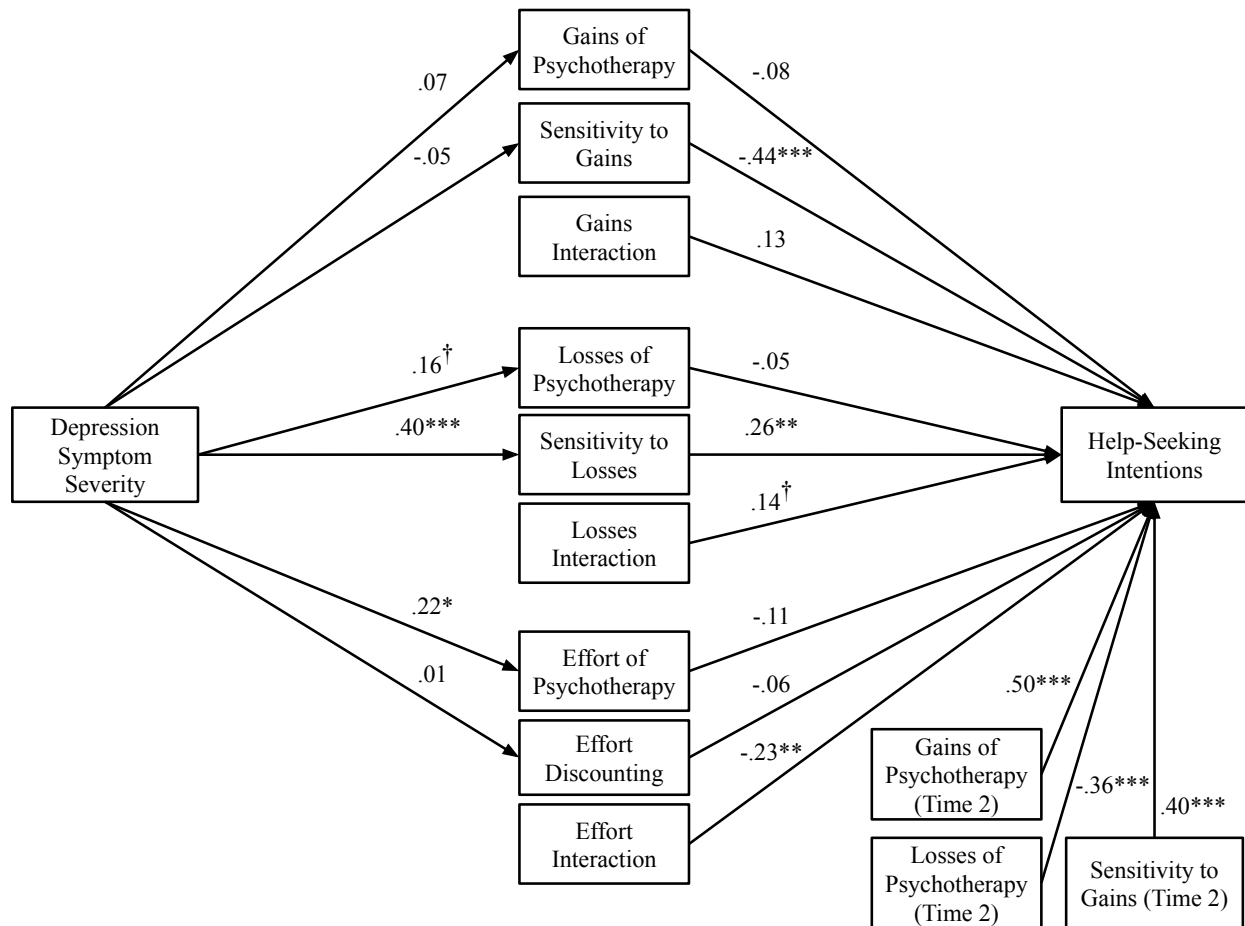
Additionally, we ran the full model using AUC values with only those who responded systematically to the effort discounting questionnaire (see Figure 12). The model accounted for a significant portion of variance in help-seeking intentions ($R^2 = .86, p < .001$), but it was a poor fit

to the data: $\chi^2(58) = 236.20, p < .001; \chi^2/df = 4.07$; RMSEA = .16; CFI = .27; TLI = .11.

Consistent with Hypothesis 1, depression symptom severity significantly predicted effort and sensitivity to losses. Its effect on losses was nearly significant, but it did not significantly predict gains, sensitivity to gains, or effort discounting. Consistent with Hypothesis 2, the interaction of effort and effort discounting significantly predicted help-seeking intentions. Additionally, sensitivity to gains and sensitivity to losses significantly predicted intentions; the effect of the interaction of losses and sensitivity to losses was nearly significant. However, effort, effort discounting, gains, the interaction of gains and sensitivity to gains, and losses did not significantly predict intentions. Correlations among exogenous variables are shown in Appendix R.

Figure 13

Full model predicting help-seeking intentions with participants who provided systematic effort discounting data



Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

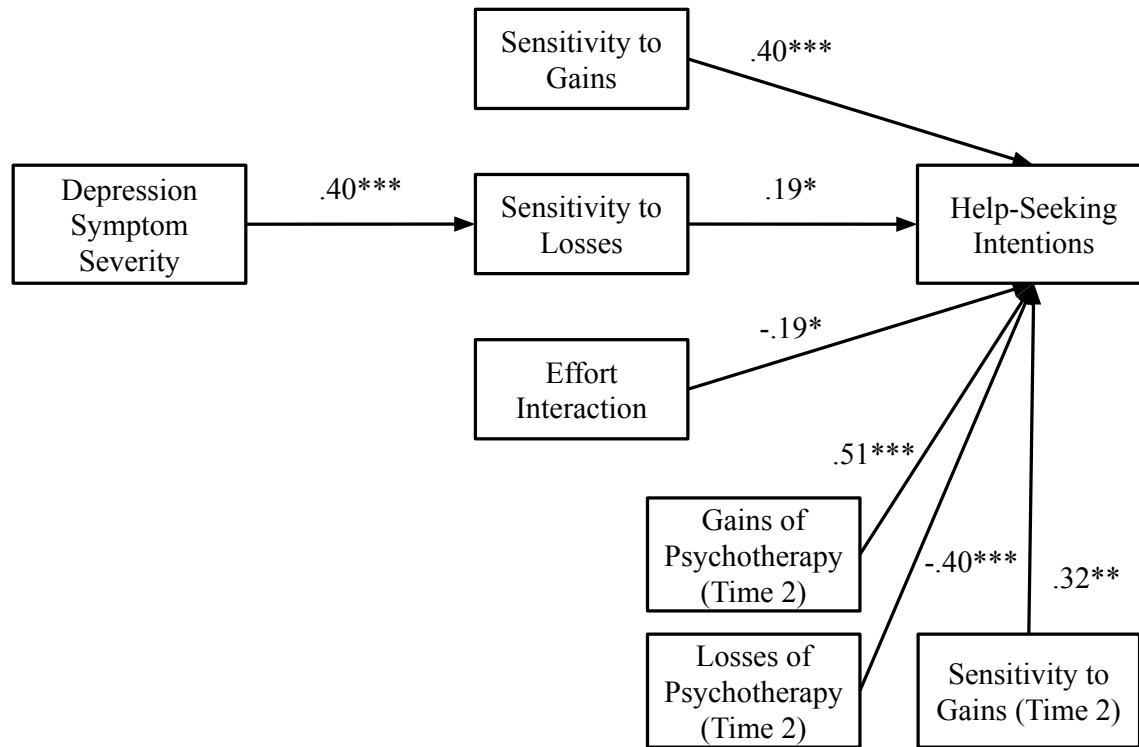
Related to Hypothesis 1, depression symptom severity positively predicted sensitivity to losses and effort; it did not predict gains, sensitivity to gains, losses, or effort discounting. Related to Hypothesis 2, sensitivity to gains, sensitivity to losses, and the interaction of effort and effort discounting predicted help-seeking intentions. The model was a poor fit to the data: $\chi^2(58) = 236.20, p < .001$; $\chi^2/df = 4.07$; RMSEA = .16; CFI = .27; TLI = .11.

[†] $p < .10$, $p < .05$, $**p < .01$, and $***p < .001$.

We then ran this model again with non-significant paths removed (see Figure 13). The modified model accounted for 79% of the variance in help-seeking intentions, $p < .001$. However, it was still a poor fit to the data: $\chi^2(14) = 60.54, p < .001$; $\chi^2/df = 4.32$; RMSEA = .17; CFI = .28; TLI = .33. Consistent with Hypothesis 1, depression symptom severity significantly predicted losses. Consistent with Hypothesis 2, the interaction of effort and effort discounting significantly predicted help-seeking intentions. Sensitivity to gains and sensitivity to losses significantly predicted help-seeking intentions as well, but the direction of the effect of sensitivity to losses was the opposite of what was predicted in Hypothesis 2: sensitivity to losses positively predicted intentions. Correlations among exogenous variables are shown in Appendix S.

Figure 14

Modified model predicting help-seeking intentions with participants who provided systematic effort discounting data



Note. Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured. The model was a poor fit to the data: $\chi^2(14) = 60.54, p < .001$; $\chi^2/\text{df} = 4.32$; RMSEA = .17; CFI = .28; TLI = .33.

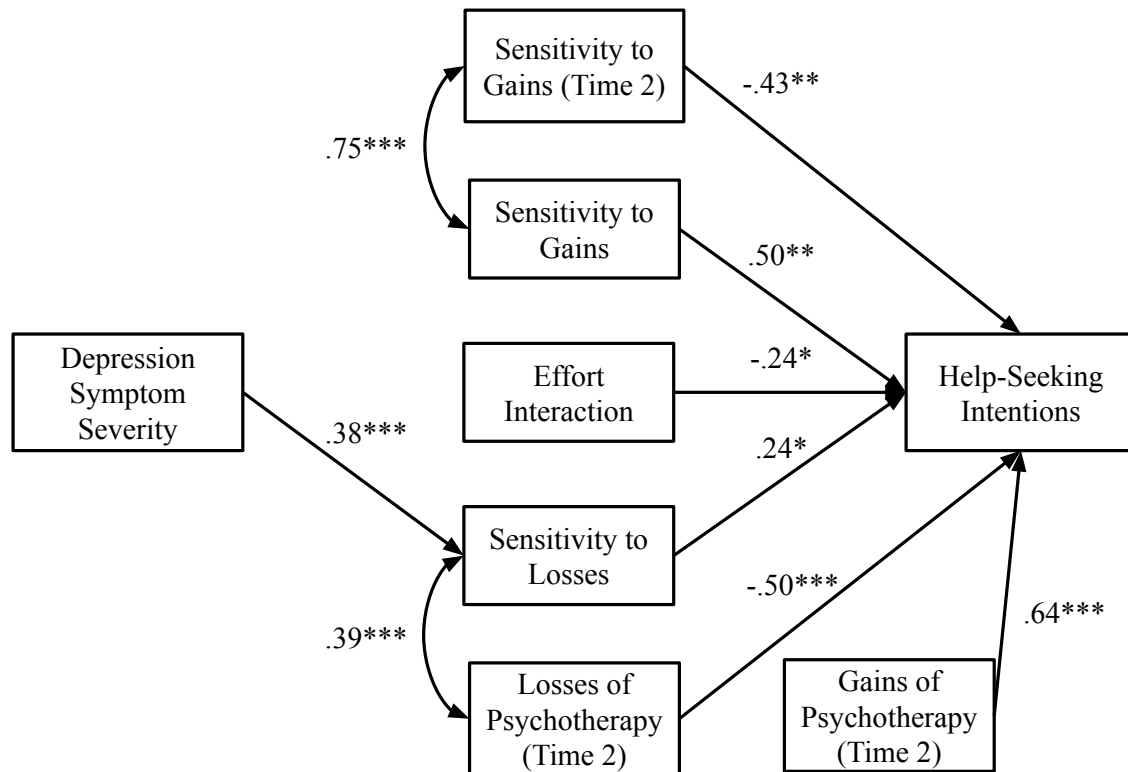
** $p < .01$, and *** $p < .001$.

After examining the model modification indices, we ran the model again while controlling for the correlations of sensitivity to gains at baseline with sensitivity to gains at the follow-up and sensitivity to losses at baseline with losses at the follow-up. All other paths were unchanged (see Figure 14). This model accounted for 67% of the variance in help-seeking intentions, $p < .001$, and it was a good fit to the data: $\chi^2(10) = 11.01, p = .357$; $\chi^2/\text{df} = 1.10$;

RMSEA = .03; CFI = .98; TLI = .98. Consistent with Hypothesis 1, depression symptom severity significantly predicted sensitivity to losses. Consistent with Hypothesis 2, the interaction of effort and effort discounting significantly predicted intentions. Sensitivity to gains and sensitivity to losses also significantly predicted intentions. Correlations among exogenous variables are shown in Appendix T.

Figure 15

Final model predicting help-seeking intentions with participants who provided systematic effort discounting data



Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

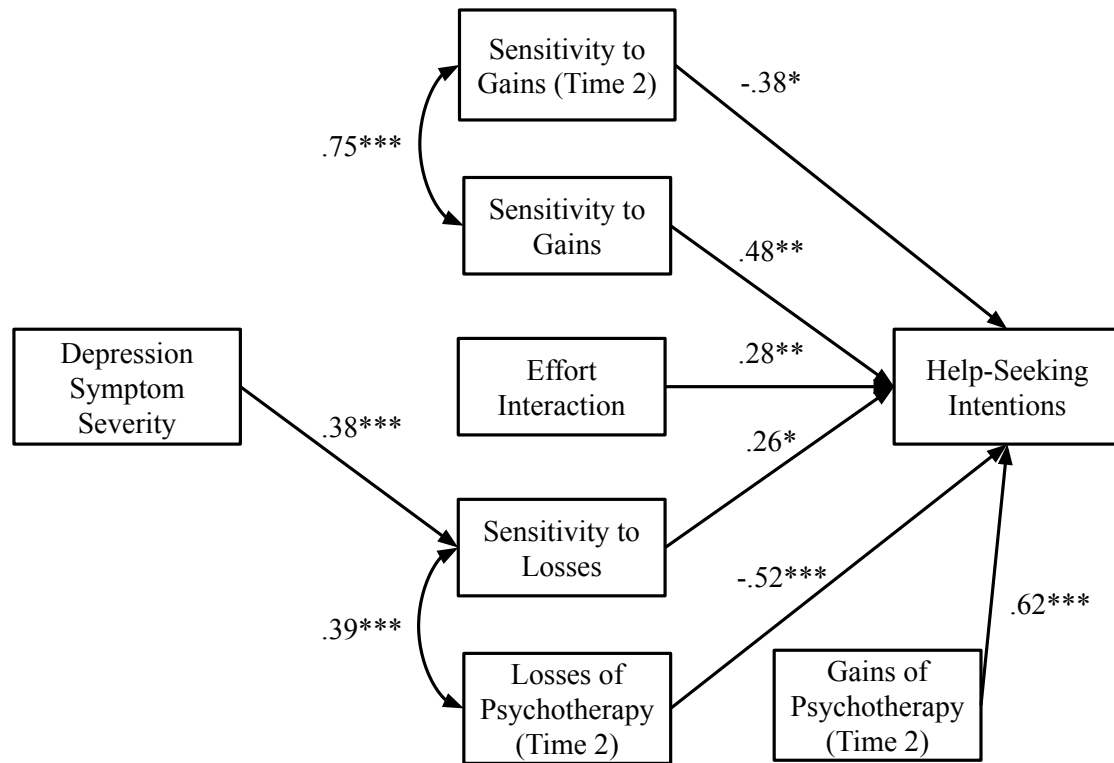
Consistent with Hypothesis 1, depression symptom severity positively predicted sensitivity to losses. Consistent with Hypothesis 2, the interaction of effort and effort discounting significantly predicted help-seeking intentions. Sensitivity to gains and sensitivity to losses also predicted intentions. The model was a good fit to the data: $\chi^2(10) = 11.01, p = .357$; $\chi^2/df = 1.10$; RMSEA = .03; CFI = .98; TLI = .98.

* $p < .05$, ** $p < .01$, and *** $p < .001$.

Additionally, we replicated this final model using the discounting parameter l instead of AUC values (see Figure 15). The model was significant ($R^2 = .70, p < .001$), and it was an adequate fit to the data: $\chi^2(10) = 13.90, p = .178$; $\chi^2/\text{df} = 1.39$; RMSEA = .06; CFI = .94; TLI = .93. Consistent with Hypothesis 1, depression symptom severity significantly predicted losses. Consistent with Hypothesis 2, the interaction of effort and effort discounting—with effort discounting operationalized as l values—significantly predicted help-seeking intentions. Sensitivity to gains and sensitivity to losses still predicted help-seeking intentions in this model. Correlations among exogenous variables are shown in Appendix U.

Figure 16

Final model predicting help-seeking intentions with participants who provided systematic effort discounting data using the discounting parameter l



Note. Numbers are standardized betas. Correlations among exogenous variables are not pictured.

Paths were unchanged from the model using AUC values for participants who provided systematic effort discounting data (see Figure 14). The model was an adequate fit to the data:

$$\chi^2(10) = 13.90, p = .178; \chi^2/df = 1.39; RMSEA = .06; CFI = .94; TLI = .93.$$

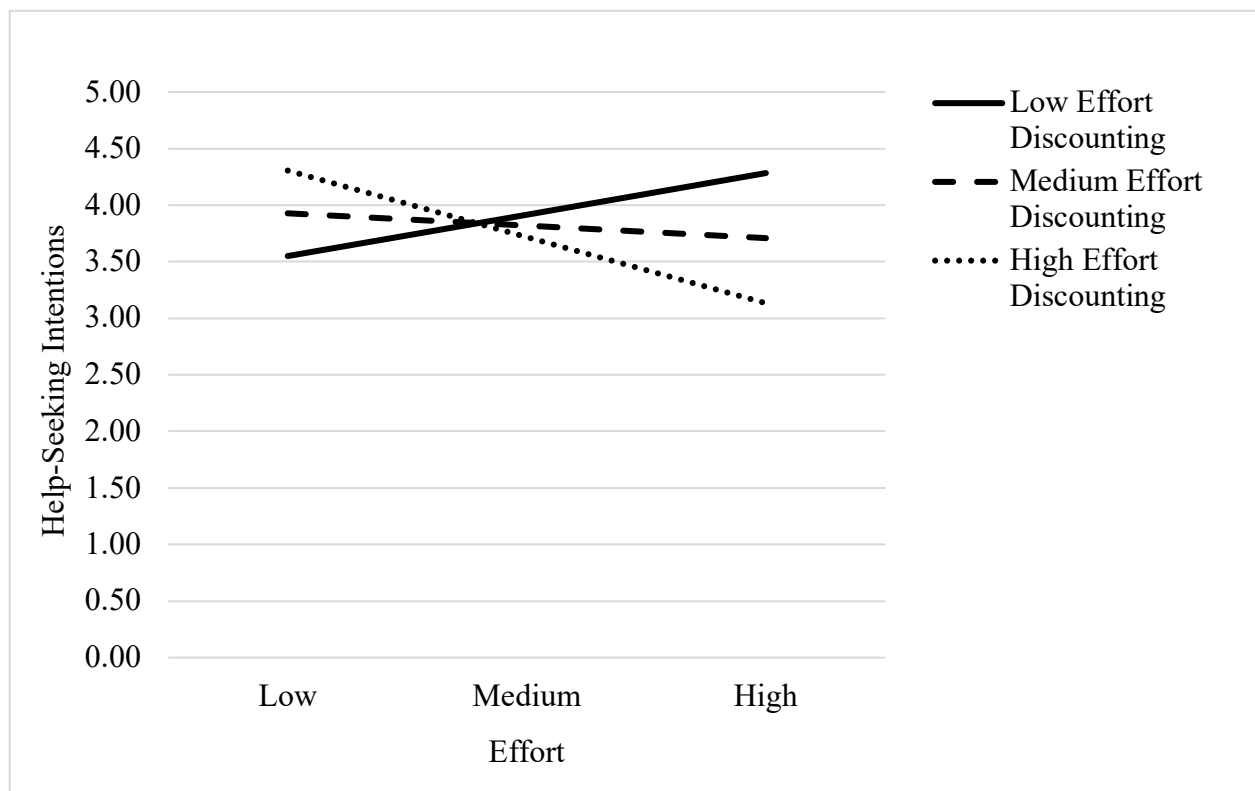
$*p < .05$, $**p < .01$, and $***p < .001$.

The interaction of effort and effort discounting (operationalized as AUC values) is illustrated in Figure 16. Among those who responded systematically to the effort discounting questionnaire, the effect of effort on help-seeking intentions depended on participants' level of

effort discounting; effort and effort discounting did not have independent effects on intentions. Specifically, among participants who were high in effort discounting, help-seeking intentions were lower when they anticipated that seeking psychotherapy would require more effort (see Figure 17). However, participants who were low in effort discounting reported higher help-seeking intentions when they anticipated that seeking psychotherapy would require more effort.

Figure 17

Help-seeking intentions at various levels of effort and effort discounting for participants who provided systematic effort discounting data



Note. Low, medium, and high values for both predictor variables are one standard deviation below the mean, the mean, and one standard deviation above the mean, respectively.

Chapter 5: Discussion

The current study tested a behavioral economic model of seeking psychotherapy among individuals with depression. First, we hypothesized that depression symptom severity would negatively predict the gains of seeking psychotherapy, negatively predict sensitivity to gains, positively predict the losses of seeking psychotherapy, positively predict sensitivity to losses, positively predict the effort of seeking psychotherapy, and positively predict effort discounting. Second, we hypothesized that gains would positively predict psychotherapy use and help-seeking intentions and that sensitivity to gains would moderate these effects, that losses would negatively predict psychotherapy use and intentions and that sensitivity to losses would moderate these effects, and that effort would negatively predict psychotherapy use and intentions and that effort discounting would moderate these effects.

In the preliminary analyses, our hypotheses were partially supported. In terms of Hypothesis 1, depression symptom severity was significantly positively correlated with the anticipated losses and effort associated with psychotherapy; it was also positively correlated with sensitivity to losses. Contrary to Hypothesis 1, depression symptom severity was not correlated with the gains of seeking psychotherapy, sensitivity to gains, or effort discounting. Related to Hypothesis 2, we found that the losses participants anticipated from psychotherapy, such as feeling embarrassed or receiving a serious mental health diagnosis, were significantly and negatively correlated with initiating psychotherapy during the next 3 months. We also found that the amount of effort that participants believed seeking psychotherapy would require was negatively correlated with psychotherapy use, though this correlation was just above the cutoff for significance. Further, the gains of seeking psychotherapy were not correlated with

psychotherapy use. However, gains, losses, effort, and sensitivity to losses were significantly correlated with help-seeking intentions.

In the structural equation modeling analyses, we also found partial support for our hypotheses. Consistent with Hypothesis 1, the models including all participants showed that depression symptom severity significantly predicted losses, sensitivity to losses, and effort in the expected directions. However, depression symptom severity did not predict gains, sensitivity to gains, or effort discounting. Additionally, in the models including only participants who provided systematic effort discounting data, the effect of depression symptom severity on losses was nearly significant, but it did not reach the cutoff for statistical significance. In terms of Hypothesis 2, losses consistently predicted a lower likelihood of psychotherapy use, as hypothesized. However, no other variables significantly predicted psychotherapy use. In contrast, losses and the interaction of gains and sensitivity to gains significantly predicted help-seeking intentions in the full sample, but effort-related variables and the interaction of losses and sensitivity to losses did not predict intentions. In the sample that provided systematic effort discounting data, sensitivity to gains, sensitivity to losses, and the interaction of effort and effort discounting significantly predicted intentions; gains, losses, effort, and the interactions of gains and sensitivity to gains and the interaction of losses and sensitivity to losses did not predict intentions.

The finding that depression symptom severity did not predict effort, effort discounting, gains, or sensitivity to gains in any of the models was unexpected in light of past research showing that these variables are associated with depression (Culbreth et al., 2018; Eshel & Roiser, 2010). However, many past studies compared individuals with depression with healthy controls (e.g., Clery-Melin et al., 2011), whereas the current study only included participants

with moderate to severe depression symptoms. It may be that the associations of these variables with depression are only apparent when comparing individuals with and without depression. Alternatively, these variables may only be related to certain types of depression symptoms or associated behavioral features that were not fully captured by the PHQ-9. For example, anhedonia as detected by behavioral tasks has been found to be negatively associated with sensitivity to gains (Pizzigalli et al., 2005). However, the current study did not use behavioral tasks to measure anhedonia, and the PHQ-9 only has one item related to anhedonia (i.e., lack of interest).

The fact that losses, gains, effort, and their interactions with sensitivity to losses, gains, and effort, did not each account for unique variance in seeking psychotherapy was also unexpected. However, this could be due in part to a lack of statistical power given the small number of participants who reported seeking psychotherapy at the 3-month follow-up. For instance, the effect of effort on psychotherapy in particular may have reached the threshold for significance with higher power since it was nearly significant in the majority of the models.

In addition to insufficient power, the lack of effect of other variables on psychotherapy use could be due to the nature of the sample. Related to the lack of a moderating effect of sensitivity to losses on the effect of losses on psychotherapy use, this may be due to high sensitivity to losses among individuals with depression (Eshel & Roiser, 2010). Specifically, the losses of psychotherapy might have weighed heavily enough for these participants—who all reported at least moderately severe depression symptoms—that their effect was the same regardless of individual differences in sensitivity to losses. Similarly, the lack of effect of gains on psychotherapy use could be due to insufficient sensitivity to gains in the sample. Indeed,

participants reported significantly higher sensitivity to losses than to gains overall, $t(252) = 20.52, p < .001, d = 1.29$.

The lack of effect of effort or effort discounting in the model predicting psychotherapy use was also unexpected, especially given effort's zero-order correlation with seeking psychotherapy and participants' frequent endorsement of effort as a help-seeking barrier. In fact, effort was the second-most commonly cited barrier to treatment after cost (see Table 2), and participants at the follow-up survey ($n = 84$) indicated that the amount of effort required to seek psychotherapy had some effect on whether they tried to get psychotherapy in the last 3 months, $M = 3.61$ on a scale of 1 to 7, $SD = 1.95$. The interaction of effort and effort discounting did significantly predict help-seeking intentions, though, but only among participants who responded systematically on the effort discounting questionnaire. When we ran the model predicting psychotherapy use with only these participants, there were too few who had sought psychotherapy to produce reliable model estimates. Thus, the lack of effect of effort-related variables on seeking psychotherapy in the full sample could be due to nonsystematic responding on the effort discounting questionnaire and the small number of participants who sought psychotherapy during the follow-up period. Alternatively, it may be that the interaction of effort and effort discounting only affects help-seeking intentions rather than influencing seeking psychotherapy directly.

In contrast to the models predicting seeking psychotherapy, the model predicting help-seeking intentions was the best fit to the data when it included the interaction of gains and sensitivity to gains in addition to losses. Comparisons with the model predicting psychotherapy use are tentative given the small number of participants who sought psychotherapy during the study. However, this difference could be due to gains, sensitivity to gains, and their interaction

indirectly affecting psychotherapy use over time. That is, it may take longer than 3 months for gains to affect help-seeking intentions and for intentions to then influence psychotherapy use. Alternatively, it could be that gains have less influence on psychotherapy use than they do on verbal behavior regarding psychotherapy (i.e., endorsement of positive help-seeking intentions). This may be due to higher sensitivity to losses than gains in the sample. Specifically, the losses associated with endorsing positive help-seeking intentions likely are minimal, and this may have allowed the gains of seeking help to influence ratings of intentions. However, the losses associated with actually seeking psychotherapy may be higher, which could have outweighed an influence of gains on seeking psychotherapy.

Although it is unclear why the interaction of gains and sensitivity to gains predicted help-seeking intentions and not psychotherapy use, the nature of this interaction is notable. As hypothesized, gains had the strongest positive effect on intentions among those who were highly sensitive to gains. However, among participants who were low in sensitivity to gains, help-seeking intentions were strongest at low levels of gains and lowest at high levels of gains. In other words, for participants with low sensitivity to gains, anticipating that psychotherapy would be more beneficial was associated with weaker help-seeking intentions, but anticipating that it would be less beneficial was associated with stronger help-seeking intentions. While this is counterintuitive, past experimental research has found that individuals with depression often have negative reactions to messages that frame help-seeking positively (Lienemann & Siegel, 2016; Siegel et al., 2019). For example, some depressed participants reported sadness and an increased sense of isolation while viewing a help-seeking advertisement showing an individual with depression receiving support from friends for seeking help (Siegel et al., 2019). A similar process might have occurred for participants in the current study while completing the survey on

the gains of seeking psychotherapy. For instance, considering that psychotherapy might lead to “having more support” (item 9 on the questionnaire) may have caused sadness or shame at a perceived lack of social support, which could have had a negative effect on help-seeking intentions. This may have been especially likely for participants who were low in sensitivity to gains due to negative cognitive biases.

Effort and effort discounting also significantly interacted to predict help-seeking intentions among participants who responded systematically to the effort discounting questionnaire. This indicates that effort discounting only was relevant to help-seeking intentions for those who demonstrated sensitivity to effort. As in the case of the interaction of gains and sensitivity to gains, the interaction of effort and effort discounting was complex. As hypothesized, individuals who were high in effort discounting reported the strongest help-seeking intentions if they anticipated that seeking psychotherapy would require little effort, and they reported the weakest help-seeking intentions if they believed it would be highly effortful. However, participants who were low in effort discounting showed the opposite pattern: help-seeking intentions were lowest among those who believed seeking psychotherapy would require little effort and highest for those who believed it would be highly effortful.

This pattern was unexpected since all participants demonstrated systematic effort discounting (i.e., their responses indicated that the subjective value of rewards decreased as the amount of effort required to receive them increased). However, preferences to engage in a task for a reward versus passively receive a reward (i.e., contrafeeloading) have been documented in humans (Tarte, 1981) and non-human animals (e.g., Czaczkes et al., 2018). This may be due in part to expectations that rewards that require effort will be larger or more reinforcing (Czaczkes et al., 2018). Expenditure of effort has been shown to increase sensitivity to gains in humans

(Hernandez-Lallement et al., 2014). Thus, participants who were low in effort discounting and who expected seeking psychotherapy to be effortful may have also anticipated that it would be more beneficial. This may then have led to strong help-seeking intentions.

In the model with only participants who provided systematic effort discounting data, we found that sensitivity to gains and losses—rather than gains and losses themselves—predicted help-seeking intentions. Additionally, sensitivity to losses was positively associated with help-seeking intentions, which was the opposite direction than hypothesized. It could be that participants who were more sensitive to losses in general were also more sensitive to the losses associated with going without psychotherapy (i.e., living with untreated depression), which ultimately led to higher help-seeking intentions. However, it is unclear why this would only be the case for participants who responded systematically on the effort discounting questionnaire. Perhaps systematic responding related to effort discounting was also associated with more predictable or consistent sensitivity to gains and losses, which resulted in significant effects of these variables on intentions.

It is also notable that 53% of participants provided non-systematic effort discounting data in spite of passing both validity checks in the effort discounting questionnaire. The validity checks required participants to discriminate a difference of \$2.00 in reward value and the difference in effort between the 2-digit and 4-digit levels of the digit span task. However, the questionnaire itself required participants to discriminate between \$0.50 differences in reward magnitude and differences in effort between adjacent levels of the digit span task (e.g., the 2-digit and 3-digit levels). Thus, passing the validity checks may not have ensured that participants would discriminate between the smaller reward and effort differences throughout the questionnaire.

Limitations and Future Directions

The results of the current study should be interpreted in the context of a number of limitations. First, there was substantial attrition in the follow-up survey. Comparisons between those who did and did not complete the follow-up showed that those who were more severely depressed and less sensitive to gains were also more likely to drop out. It is possible that this affected the results of our models. For example, having fewer participants at the follow-up who were severely depressed at baseline might have excluded participants who were more likely to seek psychotherapy (i.e., due to higher need for treatment) or less likely to seek psychotherapy (i.e., due to the marginal negative correlation between PHQ-9 scores and psychotherapy use; see Table 4). If participants who were more depressed and less sensitive to gains were more or less likely to seek psychotherapy, then relationships among depression symptom severity, gains, and psychotherapy use could have been masked because of higher attrition among these participants. Future longitudinal studies could attempt to reduce attrition by offering larger incentives or sampling from different populations (e.g., college students).

Second, only a small proportion of participants who completed the follow-up survey reported attending psychotherapy during the follow-up period. In addition to limiting the generalizability of the results, this likely led to insufficient power, particularly in analyses that only included participants who provided systematic effort discounting data. Further, the imbalance between groups who did and did not seek psychotherapy may have biased path estimates in the models (Puhr et al., 2017). Because of this, the results of analyses predicting psychotherapy use, rather than help-seeking intentions, are tentative. Future research could use longer follow-up periods to address this limitation, as more participants would likely initiate psychotherapy over time. Alternatively, studies could recruit individuals who are already in

psychotherapy to test whether behavioral economic variables predict self-reported delays between symptom onset and initiating psychotherapy (e.g., Jarmolowicz et al., 2016). Future studies could attempt to over-sample individuals who may be most likely to seek psychotherapy (King & Zeng, 2001). For instance, those who deny strong intentions to seek psychotherapy could be excluded from longitudinal designs, or larger samples could be used to recruit enough individuals who will seek psychotherapy over time. Based on the rate of seeking psychotherapy in the current study (approximately 4%), studies with at least several hundred participants may be needed to adequately test simple predictive models depending on the data structure of the models (e.g., effect sizes, correlations among predictors; Courvoisiera et al., 2011).

Third, this study used an observational design. This allowed for testing a large number of predictors of seeking psychotherapy and help-seeking intentions. This was advantageous since this was one of the first studies that have tested a behavioral economic model of help-seeking. However, an observational design precludes making causal inferences. Additional experimental research is needed to address causality. For instance, brief manipulations of effort discounting, perhaps similar to those previously used to manipulate delay discounting (Koffarnus et al., 2013), could be used to test whether lowering effort discounting affects help-seeking intentions and future help-seeking behavior. Additionally, experimentally manipulating both effort discounting and perceptions of the amount of effort that seeking psychotherapy requires could clarify the interaction found between effort and effort discounting in the current study.

Fourth, this study did not measure psychological symptoms aside from depression. However, mood-related symptoms are common across a variety of mental health concerns (e.g., anxiety, trauma, substance use; Hasin et al., 2018). As such, it is likely that our sample included individuals with disorders besides depression. The presence of multiple forms of pathology may

have led to some participants facing even greater practical barriers to seeking help than those with depression alone due to greater distress and impairment (e.g., lower financial resources to pay for psychotherapy). Past research has also found differences in decision-making between those with a depressive disorder alone and those with other disorders comorbid with depression (e.g., Posttraumatic Stress Disorder; Engelmann et al., 2013). Thus, although allowing for comorbidity in the sample may increase ecological validity, it is difficult to tell whether our results were impacted by the presence of other pathologies. Research designs that include clinical interviews or self-report screenings of common comorbidities, such as anxiety or substance use disorders, could clarify whether these conditions modify the relationships among behavioral economic help-seeking predictors.

Fifth, this study's results could be limited by low-quality responses that are common to MTurk. For instance, Craft et al. (2022) found that rates of non-systematic responding in a delay discounting task were high among MTurk workers with Alcohol Use Disorder and that these responses were not significantly different from randomly generated responses. Similarly, the overall reliability and convergent validity of unscreened survey data from MTurk was found to decrease from 2015 to 2019 (Chemielewski & Kucker, 2020). However, data quality remained high when participants who failed validity checks were screened out (i.e., internal consistency and correlations among related measures were similar in magnitude to past research with non-MTurk samples; Chemielewski & Kucker, 2020). In the present study, the final sample only included participants who passed all attention checks and the validity checks in the effort discounting questionnaire. Additionally, results replicated past findings regarding associations of gains and losses with help-seeking intentions (e.g., Topkaya et al., 2017). Differences in results between participants who did and did not provide systematic effort discounting data were also

explored. Taken together, these measures suggest that the quality of the data in the present study is similar to the quality of data from other common sources (e.g., college students).

Finally, individuals of marginalized groups were underrepresented in this study. For example, although the percentage of Non-Hispanic White participants in our sample was similar to that of the U.S. population (approximately 76%; U.S. Census Bureau, 2021), our results still may not be representative of individuals from other racial or ethnic backgrounds. Additionally, the current study's quantitative focus precluded examining how participants' backgrounds and identities influenced their perceptions of seeking psychotherapy or affected their sensitivity to gains, losses, and effort. For instance, individuals with chronic experiences of discrimination or prejudice may be more sensitized to the anticipated social losses of seeking psychotherapy, leading to a lower likelihood of seeking treatment. Indeed, among Black individuals in the United States, experiences of racial microaggressions in daily life negatively predicted intentions to seek psychotherapy (Crawford, 2011). Similar experiences may also impede help-seeking among individuals with other marginalized identities (e.g., based on sexual orientation, gender identity, socioeconomic or ability status). In the future, qualitative or mixed methods studies could examine how such experiences affect perceptions of the gains, losses, and effort associated with seeking psychotherapy. Additionally, quantitative studies could test associations of experiences of microaggressions or other forms of discrimination with sensitivity to gains, losses, or effort among individuals with depression.

In addition to addressing the limitations of the current study, future research is needed to clarify how aspects of individuals' current contexts affect seeking psychotherapy. For example, help-seeking may be more likely for those who anticipate that continuing to go without psychotherapy will be highly effortful or unpleasant. Future research could test whether the

effort, gains, and losses of going untreated also predict psychotherapy use. In particular, research could test whether the difference in effort between going untreated and the effort associated with seeking psychotherapy has different effects at different levels of effort. The fact that effort discounting followed a hyperbolic function suggests that the subjective value of rewards is more steeply discounted at small differences in effort than at large ones. Thus, the difference in effort between going untreated and seeking psychotherapy may have differing effects depending on the size of this difference (i.e., stronger effects at smaller effort differences). However, our results also suggest that individual differences in effort discounting would moderate such effects. As such, additional research is needed to investigate interactions among various aspects of going without psychotherapy, seeking psychotherapy, and sensitivity to these aspects (i.e., sensitivity to gains, losses, and effort).

Relatedly, future research could examine how completing a depression screening such as the PHQ-9 influences the anticipated gains, losses, and effort associated with going untreated versus seeking psychotherapy. For instance, reflecting on one's symptoms during a screening may increase the salience of the consequences of going untreated. Completing depression screenings has led to increased recognition of participants' own symptoms and increased the likelihood of searching for mental health-related information on the internet, even in the absence of feedback on screening results (Jacobson et al., 2022; Kumpmann, 2022). As such, it is possible that the screening process used in the present study affected responses on measures of help-seeking intentions, behavioral economic help-seeking predictors, and actual psychotherapy use. Future research is needed to clarify the effects of screening procedures on these variables.

Additionally, future research could examine whether effort discounting tasks more directly related to the consequences of seeking psychotherapy predict psychotherapy use. For

example, rather than answering questions about monetary rewards, participants could indicate their preferences for various amounts of symptom reduction for different levels of effort (e.g., “Would you prefer to feel 10% less depressed for a small amount of effort, or 50% less depressed for a large amount of effort?”). Similar, behavior-specific discounting questionnaires have been used in other areas, such as sexual decision-making (Lawyer et al., 2010) and impulsive food choices (Rasmussen et al., 2010). Future studies may examine whether effort discounting questionnaires specific to psychotherapy use can capture discounting in a way that is valid and predictive of seeking psychotherapy.

Implications for Help-Seeking Interventions

The consistent effect of losses on help-seeking variables in the current study suggests that mitigating the anticipated losses of psychotherapy may facilitate help-seeking among those with depression. As one example, public service announcements (PSAs) encouraging help-seeking for depression could focus on refuting common negative misperceptions of psychotherapy. For instance, PSAs could educate clients about the focus on collaboration and goal consensus in psychotherapy to reduce concerns about therapists using unhelpful interventions. Similar interventions providing pre-treatment education about psychotherapy have been shown to reduce rates of premature termination (Swift et al., 2012; Walitzer et al., 1999). Additionally, a combination of reducing the objective losses of psychotherapy and PSAs to increase awareness of such changes may be needed to encourage help-seeking. This survey and others (e.g., American Psychological Association, 2014) have found that the cost of seeking psychotherapy is the most commonly cited barrier to receiving treatment (see Table 2). Given that, policy efforts to increase the affordability of psychotherapy may be particularly needed. Such changes would

then need to be followed by interventions to increase public awareness of relevant policies in order to affect psychotherapy use.

In spite of the potential utility of decreasing the anticipated losses of psychotherapy, past research has found that such PSAs had negative effects on help-seeking intentions when participants felt that they were not relevant to their particular concerns about seeking treatment (Lienemann & Siegel, 2018). As such, it could be that interventions need to be tailored to specific populations to be most effective. For instance, qualitative studies have found that among women with postpartum depression, barriers such as confusion about whether they could talk to their child's pediatrician about their depression and concerns about being viewed as a "bad mother" hindered help-seeking (Hadfield & Wittkowski, 2017). Thus, educating perinatal women about psychotherapy referral pathways and reducing perceived public stigma might be effective in this population. In contrast, a meta-analysis of college students' help-seeking found that concerns that treatment would not work was a larger help-seeking barrier than stigma (Li et al., 2014). Thus, PSAs for this population may be most effective if they challenge beliefs that psychotherapy will be unhelpful. Qualitative and mixed methods research on help-seeking barriers and interventions in specific populations of individuals with depression will likely assist in tailoring interventions to mitigate the perceived losses of psychotherapy in various groups of interest.

Results of the current study also suggest that help-seeking interventions that optimize the anticipated gains and effort associated with psychotherapy could improve help-seeking intentions. For example, PSAs that include psychoeducation on the benefits of psychotherapy and testimonials from individuals who have received psychotherapy could increase the perceived gains of psychotherapy and enhance help-seeking intentions among those with high sensitivity to

gains (Martielli, 2006). Additionally, reducing the amount of effort required to initiate psychotherapy (e.g., creating streamlined, patient-facing methods of finding an in-network provider) could increase help-seeking intentions among those who are high in effort discounting.

However, it is possible that interventions focused on the gains and effort associated with psychotherapy would have negative effects on some individuals depending on their rates of effort discounting and sensitivity to gains. Specifically, our results suggest that among those with depression, increasing the perceived gains of psychotherapy may be beneficial for individuals who are high in sensitivity to gains, but it may discourage psychotherapy use for those who are low in sensitivity to gains. Similarly, reducing the amount of effort associated with psychotherapy may result in greater help-seeking intentions for individuals who are high in effort discounting, but it may lower help-seeking intentions among those who are low in effort discounting. Unfortunately, it may not be possible to determine individuals' levels of effort discounting and sensitivity to gains outside of a research setting. As such, interventions that target gains or effort could have unpredictable effects on psychotherapy use if they are implemented widely. Further research is needed to test the effects of interventions focused on the gains and effort of psychotherapy.

Conclusion

The current study tested associations among depression symptom severity, behavioral economic variables, and psychotherapy use and help-seeking intentions among individuals with moderate to severe depression symptoms over a 3-month period. We found that depression symptom severity was positively associated with the degree of effort and losses that participants anticipated that seeking psychotherapy would entail; depression symptom severity was also associated with higher sensitivity to losses. In turn, losses at baseline prospectively and

negatively predicted initiating psychotherapy during the next 3 months. Additionally, the gains of psychotherapy and sensitivity to gains at baseline interacted to predict help-seeking intentions at the 3-month follow-up. The interaction of effort and effort discounting significantly predicted help-seeking intentions as well, but only among those who responded systematically on the effort discounting questionnaire. Taken together, these results suggest that reducing the magnitude of the perceived losses of psychotherapy could increase psychotherapy use among individuals with depression. Future research is needed to test ways to accomplish this and to clarify whether addressing the perceived gains and effort associated with psychotherapy can encourage help-seeking for depression.

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Appendix A

Informed Consent

Please read this consent document carefully before you decide to participate in this study.

Purpose of the research study:

The purpose of this study is to learn about why some people decide to seek treatment for mental health concerns. In order to participate, you must not be receiving current psychotherapy/counseling from a mental health professional (i.e., psychologist, licensed counselor, social worker, psychiatrist, marriage and family therapist).

What you will be asked to do in the study:

Participation in this study consists of completing a set of surveys that ask about your mental health, your opinions about and past use of psychotherapy/counseling, and your preferences more broadly. There is also a follow-up survey that you will be invited to complete in 3 months. There are no right or wrong responses to questions on these surveys. You do not have to answer any questions you do not want to answer. It typically requires 30-40 minutes to complete the first set of surveys, and an additional 30-40 minutes to complete the set of surveys in 3 months. We are inviting approximately 250 participants to complete this survey.

Risks and Benefits:

There are no direct benefits to you for participating in this study. There are no known risks involved in completing the questionnaires, and many participants find that they learn something about themselves from answering the items. You may benefit by participating in this study through increased awareness and self-understanding. You will also be contributing to knowledge that will help researchers further understand why some people seek mental healthcare. You may contact the researchers about your reactions during or after any of the phases of this study (see below for contact information). At the end of the first survey, you will receive \$0.20 in your MTurk account. If you complete the second survey, you will receive an additional \$0.80.

Confidentiality:

Your identity will be kept confidential to the extent provided by law. Your information will be identified through your MTurk worker ID. If you enter your email to be notified of the 3-month follow-up, your information will also be connected to your email address. All data files will only be accessible to the investigators and will be kept in a password-protected computer. Neither your worker ID nor your email address will be used in any report based on this study. After data collection is complete, your email address and worker ID will be deleted from your responses.

Voluntary participation:

Your participation in this study is completely voluntary. There is no penalty for not participating. If you do not complete the entire survey, you will not receive compensation.

Right to withdraw from the study:

You have the right to withdraw from the study at any time without consequence. If you withdraw, you will not receive compensation.

Whom to contact if you have questions about the study:

If you have any questions concerning the study, you may contact Joshua K. Swift, Department of Psychology, Idaho State University, Pocatello, ID, 83209, swifjosh@isu.edu, or Wilson Trusty, truswils@isu.edu.

Whom to contact about your rights as a research participant in the study:

Any questions or concerns about your rights in this study can be directed to the Idaho State University HSC Office at (208) 282-2179 or (208) 282-3371.

Agreement:

I certify that I have read the preceding and that I have freely agreed to participate in this research study.

Agree

Appendix B

Patient Health Questionnaire-9

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

1-----	2-----	3-----	4-----
Not at all	Several days	More than half the days	Nearly every day

1. Little interest or pleasure in doing things
2. Feeling down, depressed, or hopeless
3. Trouble falling or staying asleep, or sleeping too much
4. Feeling tired or having little energy
5. Feeling upbeat, happy, and hopeful
6. Poor appetite or overeating
7. Feeling bad about yourself – or that you are a failure or have let yourself or your family down
8. Trouble concentrating on things, such as reading the newspaper or watching television
9. Moving or speaking so slowly that other people have noticed. Or the opposite – being so fidgety or restless that you have been moving around a lot more than usual
10. Thoughts that you would be better off dead, or of hurting yourself
11. If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

1-----	2-----	3-----	4-----
Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult

Note. Item 5 is a validity check and was not included in the total score.

Appendix C

Gains and Losses of Seeking Psychotherapy

1-----2-----3-----4-----5-----6-----7
 Very unlikely Very likely

How likely is it that the following would happen to you if you made a psychotherapy appointment in the next 3 months?

1. Get useful advice
2. Worry my family or friends
3. Feel better
4. Feel worse
5. Have someone to talk to
6. Find out I have a serious condition
7. Feel more in control of managing stress
8. Be embarrassed
9. Have more support
10. Feel uncomfortable
11. Understand what is going on with me
12. Feel judged
13. Keep on track with school, work, or other important tasks
14. End up with an unhelpful professional

Appendix D

Sensitivity to Punishment Sensitivity to Reward Questionnaire – Revised and Clarified

Directions: Please read the following questions carefully. Then give an answer to each question by marking one of the options. Because people are different, there are no right or wrong answers to these questions. Choose only one response for each item. Do not leave any items blank.

1-----	2-----	3-----	4-----	5
Very untrue	Somewhat untrue	Neither untrue nor true	Somewhat true	Very true

1. I am afraid of new or unexpected situations.
2. I like being the center of attention at a party or a social gathering.
3. I am easily discouraged in difficult situations.
4. When I am in a group, I try to make my opinions the most intelligent or the funniest.
5. I am a shy person.
6. I take the opportunity to pick up people I find attractive.
7. I avoid demonstrating my skills for fear of being embarrassed.
8. The possibility of social advancement moves me to action, even if this involves not playing fair.
9. I worry about things that I said or did.
10. I prefer activities that lead to an immediate gain.
11. I think that I could do more things if it was not for my insecurity or fear.
12. I like to compete and do everything I can to win.
13. Compared to people I know, I am afraid of many things.
14. I do things for quick gains.
15. I find myself worrying about things so much that my ability to perform other mental tasks is impaired.
16. I like to make a competition out of all of my activities.
17. I refrain from doing something I like in order to not be rejected by or disapproved of by others.
18. I would like to be a socially powerful person.
19. I refrain from doing something because of my fear of being embarrassed.
20. I like displaying my physical abilities even though this may involve danger.

Appendix E

Effort Required to Seek Psychotherapy

1-----2-----3-----4-----5-----6-----7
Not at all Extremely

1. For me, seeking psychotherapy would be
 - a. Physically effortful
 - b. Physically difficult
 - c. Emotionally effortful
 - d. Emotionally difficult
 - e. Mentally effortful
 - f. Mentally difficult
2. Overall, how effortful would it be for you to seek psychotherapy?
3. Overall, how difficult would be for you to seek psychotherapy?

Appendix F

Effort Discounting Questionnaire

Directions: Next, you will be asked to make choices about completing various levels of the memory task for money. This is a hypothetical situation, and so you cannot actually earn the money, and you will not actually complete the memory task again. However, please try to answer each question as if you really could get the money for doing the task. Assume that all levels of the memory task take the same amount of time.

1. Which would you prefer?
 - a. \$4.00 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
2. Which would you prefer?
 - a. \$2.00 for completing the 6-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
3. Which would you prefer?
 - a. \$2.00 for completing the 6-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
4. Which would you prefer?
 - a. \$4.00 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
5. Which would you prefer?
 - a. \$0.00 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit memory Task
6. Which would you prefer?
 - a. \$0.50 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
7. Which would you prefer?
 - a. \$1.00 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
8. Which would you prefer?
 - a. \$1.50 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
9. Which would you prefer?
 - a. \$2.00 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task

10. Which would you prefer?
 - a. \$2.50 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
11. Which would you prefer?
 - a. \$3.00 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
12. Which would you prefer?
 - a. \$3.50 for completing the 2-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
13. Which would you prefer?
 - a. \$0.00 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit memory Task
14. Which would you prefer?
 - a. \$0.50 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
15. Which would you prefer?
 - a. \$1.00 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
16. Which would you prefer?
 - a. \$1.50 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
17. Which would you prefer?
 - a. \$2.00 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
18. Which would you prefer?
 - a. \$2.50 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
19. Which would you prefer?
 - a. \$3.00 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
20. Which would you prefer?
 - a. \$3.50 for completing the 3-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
21. Which would you prefer?
 - a. \$0.00 for completing the 4-Digit Memory Task

- b. \$4.00 for completing the 6-Digit Memory Task
22. Which would you prefer?
- a. \$0.50 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
23. Which would you prefer?
- a. \$1.00 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
24. Which would you prefer?
- a. \$1.50 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
25. Which would you prefer?
- a. \$2.00 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
26. Which would you prefer?
- a. \$2.50 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
27. Which would you prefer?
- a. \$3.00 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
28. Which would you prefer?
- a. \$3.50 for completing the 4-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
29. Which would you prefer?
- a. \$0.00 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
30. Which would you prefer?
- a. \$0.50 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
31. Which would you prefer?
- a. \$1.00 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
32. Which would you prefer?
- a. \$1.50 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task

33. Which would you prefer?
- a. \$2.00 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
34. Which would you prefer?
- a. \$2.50 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
35. Which would you prefer?
- a. \$3.00 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task
36. Which would you prefer?
- a. \$3.50 for completing the 5-Digit Memory Task
 - b. \$4.00 for completing the 6-Digit Memory Task

Note. Items 1 and 2 are validity checks and are not used when calculating effort discounting rates.

Appendix G

Mental Help Seeking Intention Scale (MHSIS)

INSTRUCTIONS: For the purposes of this survey, “mental health professionals” include psychologists, psychiatrists, clinical social workers, and counselors. Likewise, “mental health concerns” include issues ranging from personal difficulties (e.g., loss of a loved one) to mental illness (e.g., anxiety, depression). Please mark the box that best represents your opinion.

If I had a mental health concern, I would intend to seek help from a mental health professional.

1 (Extremely unlikely)	2	3	4	5	6	7 (Extremely likely)
---------------------------	---	---	---	---	---	-------------------------

If I had a mental health concern, I would try to seek help from a mental health professional.

1 (Definitely false)	2	3	4	5	6	7 (Definitely true)
-------------------------	---	---	---	---	---	------------------------

If I had a mental health concern, I would plan to seek help from a mental health professional.

1 (Strongly disagree)	2	3	4	5	6	7 (Strongly agree)
--------------------------	---	---	---	---	---	-----------------------

Appendix H

Help-Seeking Questionnaire

1. Are you currently receiving medication or psychotherapy for a mental health concern?
 - a. Yes
 - b. No
2. Which are you receiving currently?
 - a. Medication
 - b. Psychotherapy
 - c. Both
3. Have you ever tried to get medication or psychotherapy for a mental health concern in the past?
 - a. Yes
 - b. No

If yes:

4. Which one did seek out (you will be asked about other treatments later)?
 - a. Medication
 - b. Psychotherapy
 - c. Both
5. Did you end up receiving this treatment?
 - a. Yes
 - b. No

If no:

6. Why didn't you receive this treatment?
(Open text box)

If yes to either treatment:

7. What type of professional did you receive treatment from (check all that apply)?
 - a. Psychologist
 - b. Psychiatrist
 - c. Physician
 - d. Physician Assistant
 - e. Nurse Practitioner
 - f. Psychiatric Nurse
 - g. Counselor
 - h. Social Worker
 - i. Marriage and Family Therapist
 - j. Other: _____

If yes to medication/both:

8. How long did you receive medication for your mental health concern?
(Scroll menus for months and years)
9. What did you receive medication for (select all that apply)?
 - a. Depression
 - b. Anxiety
 - c. Bipolar Disorder
 - d. Posttraumatic Stress Disorder (PTSD)

- e. Attention-Deficit/Hyperactivity Disorder (ADHD)
- f. Other: _____

If yes to psychotherapy/both:

10. How long did you receive psychotherapy for your mental health concern?
(Scroll menus for months and years)

11. What did you receive psychotherapy for (select all that apply)?

- a. Depression
- b. Anxiety
- c. Bipolar Disorder
- d. Posttraumatic Stress Disorder (PTSD)
- e. Attention-Deficit/Hyperactivity Disorder (ADHD)
- f. Other: _____

If yes to medication/both:

12. How long ago did you stop receiving medication for your mental health concern?
(Scroll menus for months and years)

If yes to psychotherapy/both:

13. How long ago did you stop receiving psychotherapy for your mental health concern?
(Scroll menus for months and years)

Display question 11 to all participants:

14. Have you ever received treatment for a mental health concern besides medication or psychotherapy?
- a. Yes
 - b. No

If yes:

15. What type of treatment did you receive? _____
16. What type of provider did you receive this treatment from? _____

Display question 14 to all participants:

17. Have you ever sought mental health help from a source besides a professional healthcare provider?
- a. Yes
 - b. No

If yes:

18. Where/from whom did you receive mental health help (check all that apply)?
- a. Family member
 - b. Friend
 - c. Religious leader
 - d. Teacher
 - e. Online sources
 - f. Other self-help materials for mental health (e.g., books, recordings)
 - g. Other: _____

If not currently receiving medication or psychotherapy:

19. Would you like to start receiving medication or psychotherapy for a mental health concern?
- a. Yes
 - b. No

If yes:

20. What kind of mental health treatment would you prefer (select all that apply)?

- a. Medication
- b. Psychotherapy
- c. Other: _____

If no:

21. If you did seek out treatment for a mental health concern in the future, which would you prefer (select all that apply)?

- a. Medication
- b. Psychotherapy
- c. Other: _____

22. Are there any barriers that would keep you from seeking mental healthcare even if you wanted to (e.g., too expensive, no way to attend appointments)?

- a. Yes
- b. No

Note. Qualtrics survey logic commands are bolded.

Appendix I

Demographics Questionnaire

1. What is your age in years?
(scroll menu with years)
2. What is your gender identity?
 - a. Female
 - b. Male
 - c. Gender fluid
 - d. Gender queer
 - e. Non-binary
 - f. Transgender female
 - g. Transgender male
 - h. Other: _____
3. What is your sexual orientation?
 - a. Asexual
 - b. Bisexual
 - c. Gay
 - d. Heterosexual
 - e. Lesbian
 - f. Pansexual
 - g. Other: _____
4. Which best describes your racial or ethnic identity?
 - a. Afro-Caribbean
 - b. Alaska Native
 - c. Asian
 - d. Black/African American
 - e. Latino/a/x
 - f. Mixed Race
 - g. Native American
 - h. Native Hawaiian/Pacific Islander
 - i. White
 - j. Other: _____
5. Which best describes your Hispanic origin?
 - a. Hispanic
 - b. Not Hispanic
6. What kind of area do you live in?
 - a. Rural
 - b. Small Town
 - c. Suburban
 - d. Urban
7. What is your highest level of education?
 - a. Some high school or less
 - b. High school diploma/GED
 - c. Professional certification

- d. Some college
 - e. Associate's degree
 - f. Bachelor's degree
 - g. Master's degree
 - h. Doctoral degree
8. Are you currently enrolled at a college or university?
- a. Yes
 - b. No

If yes:

9. Does your college or university offer free counseling services?
- a. Yes
 - b. No
 - c. Don't know
10. If you were to seek psychotherapy, would your insurance cover part of the cost?
- a. Yes
 - b. No

If yes:

11. Approximately what percentage of the cost of psychotherapy would your insurance cover?

(scroll menu with percentages in increments of 10)

12. Which best describes your financial situation?
- a. Lower class
 - b. Lower-middle class
 - c. Middle class
 - d. Upper-middle class
 - e. Upper class

Appendix J

COVID-19 Questions

1. Have you ever been diagnosed with COVID-19? (Yes/No)

If yes:

2. When were you diagnosed? (Month, day, and year)
3. Were you been hospitalized for COVID-19? (Yes/No)
4. Rate your degree of recovery from COVID-19 (select one):
 - a. My symptoms have gotten worse.
 - b. My symptoms have not changed.
 - c. My symptoms have improved but not fully gone away.
 - d. My symptoms are completely gone.
5. Has anyone close to you (e.g., romantic partner, close friend) been diagnosed with COVID-19? (Yes/No)

Appendix K

Follow-Up Help-Seeking Questionnaire

1. Did you attend one or more sessions of psychotherapy *in the last 3 months*?
 - a. Yes
 - b. No
2. Are you currently receiving medication or psychotherapy for a mental health concern?
 - a. Yes
 - b. No
3. Which one are you receiving (you will be asked about other treatments later)?
 - a. Medication
 - b. Psychotherapy
 - c. Both

If no to question 2:

4. *In the last 3 months*, did you try to get medication or psychotherapy for a mental health concern?
 - a. Yes
 - b. No

If yes:

5. Which one did you seek out?
 - a. Medication
 - b. Psychotherapy
 - c. Both
6. *In the last 3 months*, did you end up receiving this treatment?
 - a. Yes
 - b. No

If no:

7. Why didn't you receive this treatment?
(Open text box)

If yes to either treatment:

8. What type of professional did you receive/have you been receiving treatment from in the last 3 months (check all that apply)?
 - a. Psychologist
 - b. Psychiatrist
 - c. Physician
 - d. Physician Assistant
 - e. Nurse Practitioner
 - f. Psychiatric Nurse
 - g. Counselor
 - h. Social Worker
 - i. Marriage and Family Therapist
 - j. Other: _____

If yes to medication/both:

9. *In the last 3 months*, how long did you receive/have you been receiving medication for your mental health concern?

(Scroll menu for weeks)

10. What did you receive medication for (select all that apply)?

- a. Depression
- b. Anxiety
- c. Bipolar Disorder
- d. Posttraumatic Stress Disorder (PTSD)
- e. Attention-Deficit/Hyperactivity Disorder (ADHD)
- f. Other: _____

If yes to psychotherapy/both:

11. *In the last 3 months*, how long did you receive/have you been receiving psychotherapy for your mental health concern?

(Scroll menus for months and years)

12. What did you receive psychotherapy for (select all that apply)?

- a. Depression
- b. Anxiety
- c. Bipolar Disorder
- d. Posttraumatic Stress Disorder (PTSD)
- e. Attention-Deficit/Hyperactivity Disorder (ADHD)
- f. Other: _____

If yes to medication/psychotherapy/both:

13. Compared to when you started treatment, how would you classify your degree of change?

- a. Got significantly worse
- b. Made no change
- c. Got significantly better, but did not fully recover
- d. Got significantly better and fully recovered

If no to question 1 and yes to question 5:

14. Which best describes your most recent mental healthcare experiences\?

- a. I discontinued even though my provider believed I should continue.
- b. My provider discontinued our work even though I wanted to continue.
- c. My provider and I mutually agreed that it was time to discontinue treatment.

Display question 12 to all participants:

15. *In the last 3 months*, did you receive treatment for a mental health concern besides medication or psychotherapy?

If yes:

16. What type of treatment did you receive? _____

17. What type of provider did you receive this treatment from? _____

Display question 15 to all participants:

18. Have you ever sought mental health help from a source besides a professional healthcare provider?

- a. Yes
- b. No

If yes:

19. Where/from whom did you receive mental health help (check all that apply)?

- a. Family member
- b. Friend
- c. Religious leader

- d. Teacher
- e. Online sources
- f. Other self-help materials for mental health (e.g., books, recordings)
- g. Other: _____

If not currently receiving medication or psychotherapy:

20. Would you like to start receiving medication or psychotherapy for a mental health concern?
- a. Yes
 - b. No

If yes:

21. What kind of mental health treatment would you prefer (select all that apply)?
- a. Medication
 - b. Psychotherapy
 - c. Other: _____

If no:

22. If you did seek out treatment for a mental health concern in the future, which would you prefer (select all that apply)?
- a. Medication
 - b. Psychotherapy
 - c. Other: _____
23. Are there any barriers that would keep you from seeking mental healthcare even if you wanted to (e.g., too expensive, no way to attend appointments)?
- a. Yes
 - b. No

If psychotherapy use is denied, display question 21:

24. What is the top reason that you did not seek psychotherapy in the last 3 months?
(Open text box)
25. To what extent did the effort required to seek psychotherapy affect whether you actually sought out psychotherapy?
(Likert scale from 1 [*not at all*] to 7 [*extremely*])

Note. Qualtrics survey logic commands are bolded.

Appendix L

Correlations Among All Variables at Baseline and the 3-Month Follow-Up

Variable	<i>M(SD)</i>	PHQ-9 (T2)	Gains (T1)	Gains (T2)	Losses (T1)	Losses (T2)	Effort (T1)	Effort (T2)	SPSRQ- RC: SR (T1)	SPSRQ- RC: SR (T2)	SPSRQ- RC: SP (T1)
PHQ-9 (T1)	15.50(4.21)	.55**	.07.04	-.02	.20**	.29**	.19**	.42**	.03	-.19 [†]	.31**
PHQ-9 (T2)	11.13(5.91)		-.22*	-.14	.29**	.43**	.12	.43**	-.09	-.13	.39**
Gains (T1)	4.67(1.27)			.69**	-.44**	-.32**	-.10	.02	.11 [†]	.18	.01
Gains (T2)	4.60(1.40)				-.29**	-.34**	.04	-.01	.01	.16	.04
Losses (T1)	3.89(1.25)					.56**	.45**	.37**	.10	.09	.25**
Losses (T2)	3.47(1.30)						.24*	.51**	.07	.04	.34**
Effort (T1)	4.76(1.15)							.49**	-.03	-.12	.28**
Effort (T2)	4.73(1.12)								-.18 [†]	-.08	.37**
SPSRQ-RC: SR (T1)	2.42(0.74)									.76**	-.14*
SPSRQ-RC: SR (T2)	2.22(0.71)										-.03

Note. PHQ-9: Patient Health Questionnaire-9, SPSRQ-RC: SR: Sensitivity to Punishment Sensitivity to Reward Questionnaire –

Revised and Clarified: Sensitivity to Reward subscale, SPSRQ-RC: SP: Sensitivity to Punishment Sensitivity to Reward Questionnaire

– Revised and Clarified: Sensitivity to Punishment subscale, AUC: Effort Discounting Area Under the Curve, *L*: log-transformed

hyperbolic effort discounting parameter, MHSIS: Mental Help-Seeking Intention Scale. T1: time one, T2: time two.

** $p < .01$, * $p < .05$, and [†] $p < .10$.

Correlations Among All Variables at Baseline and the 3-Month Follow-Up (Continued)

Variable	<i>M(SE)</i>	SPSRQ-RC: SP (T2)	AUC (T1)	AUC (T2)	<i>L</i> (T1)	<i>L</i> (T2)	MHSIS (T1)	MHSIS (T2)	Psychotherapy Use (T2)
PHQ-9 (T1)	15.50(4.21)	.30**	.09	-.00	-.08	-.01	-.04	-.07	-.18 [†]
PHQ-9 (T2)	11.13(5.91)	.42**	.14	-.02	-.15	.02	-.18 [†]	-.13	-.17
Gains (T1)	4.67(1.27)	-.00	.01	-.18	-.00	.17	.45**	.38**	-.04
Gains (T2)	4.60(1.40)	.07	.08	-.02	-.04	.04	.40**	.57**	-.13
Losses (T1)	3.89(1.25)	.16	-.07	.16	.08	-.18	-.42**	-.33**	-.31**
Losses (T2)	3.47(1.30)	.37**	.07	.02	-.10	-.07	-.40**	-.37**	-.09
Effort (T1)	4.76(1.15)	.20 [†]	-.02	.15	.02	-.16	-.13*	-.15	-.19 [†]
Effort (T2)	4.73(1.12)	.38**	.18 [†]	.03	-.17	-.04	-.15	-.09	-.23*
Sensitivity to Gains (T1)	2.42(0.74)	-.09	.19**	.09	-.16**	-.10	.11 [†]	.09	-.10
Sensitivity to Gains (T2)	2.22(0.71)	-.07	.20 [†]	.20 [†]	-.22*	-.23*	.12	.22*	-.25*
SPSRQ-RC: SP (T1)	3.86(0.73)	.83**	-.00	.00	.01	-.02	-.17**	.05	-.12
SPSRQ-RC: SP (T2)	3.67(0.90)		.09	-.05	-.11	.04	-.10	.04	-.13
AUC (T1)	0.47(0.22)			.52**	-.97**	-.49**	.00	.04	-.19 [†]
AUC (T2)	0.47(0.22)				-.46**	-.98**	-.11	-.05	-.21 [†]
<i>L</i> (T1)	-1.54(1.97)					.44**	.01	-.01	.20 [†]
<i>L</i> (T2)	-1.57(1.95)						.10	.03	.19 [†]
MHSIS (T1)	3.98(1.61)							.65**	-.01
MHSIS (T2)	3.99(1.76)								-.26*

Appendix M

Correlations Among Exogenous Variables Corresponding to Figure 3

Variable	$M(SE)$	Gains Interaction	Effort Interaction	Effort (Time 2)	COVID-19 Diagnosis (Time 1)
Losses Interaction	0.35(0.23)	.10*	.05	.05	-.11
Gains Interaction	0.16(0.26)		-.01	.09	.07
Effort Interaction	-0.04(0.28)			-.14 [†]	-.03
Effort (Time 2)	-1.81(0.44)				-.01
COVID-19 Diagnosis (Time 1)	--				--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

[†] $p < .10$, and * $p < .05$.

Appendix N

Correlations Among Exogenous Variables Corresponding to Figure 6

Variable	$M(SE)$	Gains Interaction	Effort Interaction	Effort (Time 2)	COVID-19 Diagnosis (Time 1)
Losses Interaction	0.35(0.23)	.05	.09 [†]	0.05	-.21
Gains Interaction	0.16(0.26)		-.02	-.13	.13
Effort Interaction	-0.04(0.28)			-.24 [†]	-.07
Effort (Time 2)	-1.81(0.44)				-.12
COVID-19 Diagnosis (Time 1)	--				--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

[†] $p < .10$.

Appendix O

Correlations Among Exogenous Variables Corresponding to Figure 7

Variable	$M(SE)$	Gains Interaction	Effort Interaction	Effort (Time 2)	COVID-19 Diagnosis (Time 1)
Losses Interaction	0.35(0.23)	.10*	-.03	.05	-.11
Gains Interaction	0.15(0.26)		.01	.09	.07
Effort Interaction	0.06(0.28)			.13 [†]	.07
Effort (Time 2)	-1.81(0.44)				.02
COVID-19 Diagnosis (Time 1)	--				--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

[†] $p < .10$, and * $p < .05$.

Appendix P

Correlations Among Exogenous Variables Corresponding to Figure 8

Variable	$M(SE)$	Gains Interaction	Effort Interaction	Gains (Time 2)	Losses (Time 2)	Sensitivity to Gains (Time 2)
Losses Interaction	0.27(0.06)	.10	.05	-.11	-.08	-.02
Gains Interaction	0.10(0.06)		-.01	-.33***	.27**	.12
Effort Interaction	-0.01(0.06)			-.09	-.12	-.11
Gains (Time 2)	0.02(0.10)				-.34***	.16
Losses (Time 2)	0.01(0.10)					.04
Sensitivity to Gains (Time 2)	0.24(0.11)					--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

** $p < .01$, and *** $p < .001$.

Appendix Q

Correlations Among Exogenous Variables Corresponding to Figure 12

Variable	$M(SE)$	Gains Interaction	Effort Interaction	Gains (Time 2)	Losses (Time 2)	Sensitivity to Gains (Time 2)
Losses Interaction	0.27(0.06)	.10	-.03	-.11	-.08	-.02
Gains Interaction	0.10(0.06)		.01	-.33***	.27**	.12
Effort Interaction	0.02(0.06)			.11	-.13	.09
Gains (Time 2)	0.02(0.10)				-.34***	.16
Losses (Time 2)	0.01(0.10)					.04
Sensitivity to Gains (Time 2)	0.24(0.11)					--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

** $p < .01$, and *** $p < .001$.

Appendix R

Correlations Among Exogenous Variables Corresponding to Figure 13

Variable	$M(SE)$	Gains Interaction	Effort Interaction	Gains (Time 2)	Losses (Time 2)	Sensitivity to Gains (Time 2)
Losses Interaction	0.29(0.09)	-.05	-.09	-.10	-.21	.10
Gains Interaction	0.11(0.09)		-.02	-.06	.29 [†]	.20
Effort Interaction	-0.03(0.09)			.06	-.08	-.04
Gains (Time 2)	0.05(0.16)				-.33*	.08
Losses (Time 2)	-0.15(0.16)					-.14
Sensitivity to Gains (Time 2)	0.25(0.16)					--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

[†] $p < .10$, and * $p < .05$.

Appendix S

Correlations Among Exogenous Variables Corresponding to Figure 14

Variable	$M(SE)$	Gains (Time 2)	Losses (Time 2)	Sensitivity to Gains (Time 2)
Effort Interaction	0.03(0.09)	.06	-.11	-.04
Gains (Time 2)	0.06(0.16)		-.31*	.08
Losses (Time 2)	-0.19(0.16)			-.16
Sensitivity to Gains (Time 2)	0.22(0.16)			--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

* $p < .05$.

Appendix T

Correlations Among Exogenous Variables Corresponding to Figure 15

Variable	$M(SE)$	Gains (Time 2)	Losses (Time 2)	Sensitivity to Gains (Time 1)	Sensitivity to Gains (Time 2)
Effort Interaction	-0.03(0.09)	.10	-.07	-.09	-.16
Gains (Time 2)	0.03(0.16)		-.37**	-.24	.04
Losses (Time 2)	-0.12(0.16)			.13	-.16
Sensitivity to Gains (Time 1)	0.03(0.09)				.75***
Sensitivity to Gains (Time 2)	0.30(0.13)				--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

** $p < .01$, and *** $p < .001$.

Appendix U

Correlations Among Exogenous Variables Corresponding to Figure 16

Variable	$M(SE)$	Gains (Time 2)	Losses (Time 2)	Sensitivity to Gains (Time 1)	Sensitivity to Gains (Time 2)
Effort Interaction	0.04(0.09)	-.09	.13	.11	.11
Gains (Time 2)	0.03(0.16)		-.38**	-.24	.04
Losses (Time 2)	-0.12(0.16)			.15	-.15
Sensitivity to Gains (Time 1)	0.03(0.09)				.75***
Sensitivity to Gains (Time 2)	0.30(0.13)				--

Note. Means, standard errors, and correlation coefficients are standardized estimates.

** $p < .01$, and *** $p < .001$.