

# ALL GOALS ARE EQUAL: NO INTERACTIONS BETWEEN DEPRESSIVE SYMPTOMS AND GOAL CHARACTERISTICS ON GOAL PROGRESS

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**Introduction.** Depression is related to poor achievement and impacts people's capacity to attain their goals (American Psychiatric Association, 2013; Johnson et al., 2010; Street, 2002). But do depressive symptoms impact goal pursuit differently depending on the kinds of goals that people pursue? **Methods.** Across three studies (total  $N = 666$  undergraduate students, total goals = 2,546), we examine the role of up to 16 goal characteristics as moderators in the relationship between depressive symptoms and goal progress. Depressive symptoms and goal characteristics were assessed at baseline, and participants reported on goal progress at a follow-up 1 month (Study 1), 4 months (Study 2), or 8 months (Study 3) later. **Results.** The effect of depressive symptoms on goal progress was nonsignificant in two out of three studies (including one with low power), but an internal meta-analysis presented a small negative effect. Most goal characteristics did not moderate the relationship between depressive symptoms and goal progress, with

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*Supplementary materials are available online at <https://osf.io/kzgv4/>.*

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Bayes factors suggesting substantial to very strong evidence in favor of the null hypotheses. **Discussion.** The kinds of goals students pursue may not matter in the presence of depressive symptoms. On one hand, this may provide a bleak outlook in highlighting that depressive symptoms impact all goals regardless of how well they are selected. On the other hand, the effects were small, which may offer a hopeful outlook for undergraduate students experiencing depressive symptoms, who may still be able to progress on their personal goals.

*Keywords:* goal pursuit, depressive symptoms/depression, goal progress

## INTRODUCTION

Depression is a prevalent and incapacitating illness, affecting more than 264 million individuals around the world (James et al., 2018). Depression, as defined in the Diagnostic and Statistical Manual (DSM-5), is characterized by the presence of depressed mood and a loss of interest or pleasure in activities formerly regarded as pleasurable, as well as the presence of other symptoms such as a reduced ability to concentrate, or feelings of worthlessness (American Psychiatric Association, 2013). Unsurprisingly, the presence of depressive symptoms thus seems to affect people's ability to set and attain their goals (Johnson et al., 2010; Watkins, 2011). The loss of interest that is characteristic of depression, as well as fatigue and a reduced ability to concentrate, has been shown to impair people's capacity to attain goals (Nezlek & Plesko, 2001). Depressive symptoms have also been associated with poor goal achievement in various domains, including academic and occupational pursuits, as well as social and interpersonal strivings (Locke et al., 2017; Ritschel & Shepard, 2018; Street, 2002). But do the kinds of goals people pursue matter? Do depressive symptoms impact goal pursuit such that some goals are less likely to be attained than others?

Goals can be defined as "cognitive representations of desired end states that a person is committed to attain" (Milyavskaya & Werner, 2018, p. 163). Goals differ from each other on many dimensions, or characteristics, such as importance, difficulty, or specificity (Austin & Vancouver, 1996). Such dimensions, which are determined at the goal setting phase (Gollwitzer, 1990), differentially relate to goal attainment (Milyavskaya & Werner, 2018). For example, characteristics such as specificity, self-efficacy, and

the quality or direction of motivation, have consistently been shown to lead to better goal progress (Locke & Latham, 2002; Koestner et al., 2008; Sheldon & Kasser, 1998). Though there are many characteristics of goals that have been studied in the broader goal literature (see Austin & Vancouver, 1996, for a review), in this article we examine 16 characteristics that are particularly relevant to goal progress. These include autonomous motivation, controlled motivation, approach motivation, avoidance motivation, extrinsic goal content, intrinsic goal content, commitment, importance, specificity, difficulty, self-efficacy, goal conflict, goal facilitation, implementation intentions, perception of others' support, and intended effort; they are described in detail below.

Depressive symptoms have been shown to impact goal progress. In longitudinal studies conducted among undergraduate students, depressive symptoms were negatively related to goal progress at both 2 weeks and 2 months after baseline (Moss & Cheavens, 2019; Moss-Pech et al., 2021), while students experiencing mild depression reported taking part in fewer goal-directed behaviors compared to their non-depressed counterparts (Hopko & Mullane, 2008). Even though depression has been linked with some of the goal characteristics listed above (e.g., approach and avoidance motivation, commitment, specificity), it is unknown whether depressive symptoms may affect goal progress differently based on those characteristics. That is, would someone experiencing depressive symptoms make more or less progress on a goal that is more difficult, or one that is less important, compared to other goals? We explore some of those possibilities below.

## GOAL CHARACTERISTICS

### AUTONOMOUS AND CONTROLLED MOTIVATION

Autonomous motivation refers to pursuing goals out of enjoyment and importance, while controlled motivation means pursuing a goal because of internal and external pressures (Deci & Ryan, 2000). In longitudinal studies, controlled motivation has been shown to be associated with increased symptoms of depression over time, as well as poor goal progress (Holding et al., 2017, 2021; Moore et al., 2020). Depression and controlled

motivation may interact over the course of goal pursuit such that for individuals presenting depressive symptoms, pursuing goals for controlled reasons may further worsen their symptoms, thereby leading to poorer goal achievement. On the other hand, pursuing goals for autonomous reasons, which has been linked with lower depressive symptoms and better goal progress, may reduce the negative impact of depressive symptoms on goal attainment (Koestner et al., 2008; Moore et al., 2020).

#### APPROACH AND AVOIDANCE MOTIVATION

A similar interaction may be at play with avoidance goals (moving away from undesirable outcomes) and approach goals (moving toward desirable outcomes; Elliot et al., 1997). Indeed, depressive symptoms have been associated with pursuing goals through avoidant means (by setting fewer approach goals and fewer approach plans; Dickson & MacLeod, 2004). People with more avoidance goals also report higher depressive symptoms and poorer goal progress (Coats et al., 1996; Elliot et al., 1997). It is thus likely that depression and avoidance motivation may feed into one another, enhancing their respective negative effect on goal attainment, while the pursuit of approach goals may act as a buffer or at the very least, not further contribute to the downward spiral (Street, 2002). Because approach goals make it easier for a person to map the steps leading to achieving the goal, they may bypass the reduced motivation that accompanies depression (Emmons & Kaiser, 1996).

#### EXTRINSIC AND INTRINSIC GOAL CONTENT

Such a moderating effect may also occur with goal content (i.e., *what* the person is pursuing). Extrinsic goal content includes aspirations of fame, appearance, or financial success, while intrinsic goal content includes affiliation, personal growth, or community contribution (Kasser & Ryan, 1996). As research indicates that people are more likely to attain intrinsic goals, individuals with depressive symptoms who pursue intrinsic goals may benefit from their positive effect on goal progress and suffer less from the negative impact of depression on their goal pursuits, while

those who pursue extrinsic goals may experience poorer goal progress (Hope et al., 2016; Kasser & Ryan, 1996).

### COMMITMENT AND IMPORTANCE

Commitment has been defined as the determination to work on the goal (Locke et al., 1981). One study has shown that early decreases in commitment and goal progress (at 2 weeks after a baseline measurement) mediate the relationship between depressive symptoms and goal attainment 2 months later (Moss & Cheavens, 2019). Whether commitment may moderate the relationship remains to be tested. The importance of a goal, or how central it is to the individual's identity (Champion & Power, 1995), is a closely related yet distinct construct (Gollwitzer, 1993). Importance may thus be hypothesized to have a similar moderating effect on the relationship between depressive symptoms and goal attainment, such that important or committed goals may be less contaminated by the loss of interest associated with depression (American Psychiatric Association, 2013; Gollwitzer, 1993).

### SPECIFICITY

The level of specificity of a goal ranges on a continuum from specific and concrete to vague and abstract (Emmons, 1992; Klein et al., 1990). Specific goals, compared to vague and abstract ones, have been shown to lead to better task performance (Klein et al., 1990; Locke & Latham, 2002). As increased specificity restricts the range of interpretation and leads to the use of better strategies, it may offset the impaired ability to make decisions and low motivation characteristic of depression (American Psychiatric Association, 2013; Klein et al., 1990). It has been shown that depressed patients with a concrete level of goal/action identification demonstrate better problem solving (Watkins & Moulds, 2005).

### DIFFICULTY

The difficulty of a goal has been measured based on its level on a performance scale, but it is commonly assessed from the

individual's subjective experience (Sheldon & Kasser, 1998; Wright, 1990). While higher goal difficulty has been suggested to increase motivation and performance in healthy populations, this may not be the case for individuals experiencing depression, who lack motivation and energy and have negative expectations, making their pursuit of difficult goals more arduous and less successful (Locke & Latham, 2002; Miranda & Mennin, 2007).

### SELF-EFFICACY

Beyond the kinds of goals that people set, their level of self-efficacy for the goal, i.e., their belief in their ability to attain it, matters (Bandura, 1977). Indeed, higher self-efficacy is linked to better performance across various domains (Multon et al., 1991; Sheldon & Kasser, 1998). People with depressive symptoms often experience feelings of hopelessness and worthlessness, and perceive that they are less likely to achieve their goals, which probably contributes to their difficulty progressing on said goals (American Psychiatric Association, 2013; Dickson et al., 2011). However, those who do have confidence in their abilities will likely persevere and progress despite their depressive symptoms (Bandura, 2010). And in fact, among individuals who are depressed, those who believe that their symptoms can improve seem to experience lower depressive symptoms and better goal progress, while those who do not, progress less (Eddington et al., 2016; Moss & Cheavens, 2019).

### CONFLICT AND FACILITATION

Conflict among goals occurs when the pursuit of a goal may impede another, while facilitation may occur when the pursuit of a goal helps support another (Boudreaux & Ozer, 2013; Emmons & King, 1988). Depressive symptoms have been associated with experiencing higher conflict among goals, and high goal conflict is associated with poorer goal attainment (Boudreaux & Ozer, 2013; Emmons & King, 1988; Kelly et al., 2011). As conflict among goals is linked to taking fewer actions toward achieving the goals, it may interact with depression's low motivation and impaired ability to make decisions, worsening goal progress

(Emmons & King, 1988). On the other hand, the negative effect of depressive symptoms on goal progress may be diminished when there is higher facilitation among goals, which is linked to greater goal attainment (Boudreaux & Ozer, 2013). However, as depressive symptoms have been associated with reduced facilitation among goals, these effects may cancel out (Dickson & Moberly, 2010).

### IMPLEMENTATION INTENTIONS

Implementation intentions are *if-then* or *when-then* plans for how, when, and where the goal will be pursued (Gollwitzer, 1999). They may mitigate the effect of depressive symptoms on goal progress by reducing strain on cognitive resources (Gollwitzer, 1999; Gollwitzer & Sheeran, 2006). Indeed, the use of implementation intentions in clinical samples, including individuals diagnosed with depression, has been demonstrated to lead to better goal attainment (Toli et al., 2016).

### PERCEPTION OF OTHERS' SUPPORT

People's perception of being supported by others in pursuing their goals, or whether they feel they can rely on their support and understanding (Brunstein, 1993), may also reduce the negative impact of depressive symptoms on goal progress. Research has shown that social support plays an important role in depression, and is linked to higher achievement (Cohen & Wills, 1985; Cutrona et al., 1994). As such, individuals experiencing depression who receive support in the pursuit of their goals may be able to overcome the low motivation or persevere in the face of obstacles.

### INTENDED EFFORT

Finally, actual effort and intended effort (i.e., how hard a person intends to try to achieve the goal) have been shown to lead to greater goal attainment (Bayuk, 2015; Sheldon & Elliot, 1999). However, fatigue, which is a recurring feature of depression, has been linked to greater perceived effort (i.e., it feels like more

effort is being exerted) and poorer task performance (Goh et al., 2022). As individuals who experience depression seem to evaluate their goal pursuits more pessimistically, they may choose to exert less effort in the pursuit of their goal, thereby progressing less and creating self-fulfilling prophecies (Dickson et al., 2011). However, those that intend to exert more effort may diminish the negative impact of depressive symptoms.

## STUDIES

While depressive symptoms appear to interfere with goal pursuit, not all goals may be equally impacted. Though some recent studies have started examining how depressive symptoms may impact goal attainment via goal characteristics (e.g., Moss & Cheavens, 2019; Moss-Pech et al., 2021), the research remains limited because it examined only a few goal characteristics and has uniquely focused on mediation. One study has investigated possible moderators in the relationship between depressive symptoms and goal progress (Moss-Pech et al., 2021), but the moderators were measured at the individual, not at the goal level. Focusing on goal-level moderators would shed light on whether the types of goals that are selected matter, such that the person may still progress on some goals, despite experiencing depressive symptoms. This article thus examines the moderating role of multiple goal characteristics in the relationship between depressive symptoms and goal progress, looking at goal characteristics that have been found to play an important role in goal attainment in the existing literature (see above for a full list). The data from three studies are included. Study 1 examines the interaction between depressive symptoms and 14 goal characteristics on goal progress assessed one month later. Studies 2 and 3 examine the interaction of depressive symptoms and 9 and 8 goal characteristics, respectively; Study 2 examines goal progress over a semester (4 months), and Study 3 examines goal progress over a full academic year (8 months). Study 1 is exploratory, and Studies 2 and 3 replicate the findings and include specific hypotheses based on the results of Study 1. All three use existing data sets (not specifically designed to answer these questions),<sup>1</sup> but the analytical decisions

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1. The data in Study 1 was used in a paper by Milyavskaya et al. (2022), and the data in Study 2 was used in a paper by Moore et al. (2020). The data in Study 3 has also



(including sample size justifications) and planned analyses were pre-registered on the Open Science Framework (OSF).<sup>2</sup> When applicable, deviations from these pre-registrations are noted in the text. All study procedures were approved by Carleton University Research Ethics Board-B and McGill University Research Ethics Board-2, and participants provided their informed consent to participate in these studies. Pre-registration links, full study materials, and supplementary materials (including appendices) can be found on OSF at <https://osf.io/kzgv4/>.

## STUDY 1

In the first study, participants were asked to list all the goals they were pursuing, and assess the characteristics of each. Their depressive symptoms were also assessed at this first time point. One month later, participants were asked to report on the progress of each goal.

## METHOD

### PARTICIPANTS

Participants included 289 university students recruited via the student participant pool at a Canadian university. They received 1.5 course credits for participating in the first time point, and for the second time point, they were given the option of being compensated with two tickets for a raffle of five cash prizes of \$50, or one raffle ticket and 0.5 course credits. One participant withdrew from the study, and the data from three outliers were removed because the number of goals listed was greater than three standard deviations from the mean. The completion rate at

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been used in the other papers (Audet et al., 2021a; Holding et al., 2017; Verner-Filion, 2020), as well as in papers using this data as part of a combination of multiple pooled datasets (Audet et al., 2021b; Hope et al., 2019; Koestner et al., 2020; Levine et al., 2020, 2021; Moore et al., 2020, 2021a, 2021b). However, none of those papers looked at the interactions between depressive symptoms and goal characteristics.

2. Study 2 was not officially pre-registered on OSF, but was analyzed after Study 3, and followed the same analysis plan. The studies were subsequently placed in the manuscript in ascending order with regard to the time intervals between baseline and follow-up (1 month in Study 1, 4 months in Study 2, 8 months in Study 3).

the second time point was 44.4% (162 participants did not complete any measure of goal progress). The final sample consisted of 126 participants who completed surveys at both time points (101 female, 25 male; aged 17 to 45 [ $M = 20.13$  years old,  $SD = 3.96$ ]; 57.1% White, 15.9% other, 15.1% Asian/Pacific Islander, 11.1% Black/African American, and 0.8% Hispanic/Latino).

## PROCEDURE

Participants came into the lab, and they were asked to list all the goals they were currently pursuing.<sup>3</sup> They were then asked to report on the characteristics of each goal (see Measures below). They also completed a measure of depressive symptoms, and demographics. Participants were invited to participate in an online follow-up survey distributed one month later, in which they were asked to report on their progress for each goal.

## MEASURES

*Depressive Symptoms.* The Patient Health Questionnaire-9 (PHQ-9; Kroenke et al., 2001) was used to measure depressive symptoms. The PHQ-9 is a nine-item measure based on the criteria for a major depressive episode as defined by the DSM-IV (American Psychiatric Association, 1994). Only 8 items were included because the item assessing suicidal ideation had to be removed due to ethical concerns from the Research Ethics Board. Participants rated items (e.g., "little interest or pleasure in doing things") on a scale of 0 (not at all) to 3 (nearly every day). A sum of the items was computed ( $\alpha = .88$ ).

*Goal Characteristics.* The following goal characteristics were assessed: autonomous motivation, controlled motivation, approach motivation, avoidance motivation, extrinsic goal content, intrinsic goal content, commitment, difficulty, specificity,

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3. Participants were randomly assigned to be presented with one of three set of instructions, which differed in the manner in which goals were defined. The three different presentations of goals (see Supplementary Appendix D) were included as part of a separate investigation. We had planned to control for this if we found significant differences between conditions on the measure of depressive symptoms, which was not the case.

self-efficacy, goal conflict, goal facilitation, implementation intentions, and perception of others' support (see items in Table 1). With the exception of autonomous ( $\omega_{\text{within}} = .65$ ,  $\omega_{\text{between}} = .83$ ) and controlled motivation<sup>4</sup> ( $\omega_{\text{within}} = .46$ ,  $\omega_{\text{between}} = .67$ ), and extrinsic ( $\omega_{\text{within}} = .43$ ,  $\omega_{\text{between}} = .84$ ) and intrinsic ( $\omega_{\text{within}} = .52$ ,  $\omega_{\text{between}} = .87$ ) goal content, many of the goal characteristics described below were assessed using single items. Although reliability cannot be calculated for single items, they are face valid, and they allow for reduced participant burden while assessing several characteristics for multiple goals. We are not aware of any studies that have assessed test-retest reliability with these items; given that these constructs are expected to fluctuate over time (as a function of goal pursuit), other methods would be preferable (such as using multiple items in future studies). Intrinsic and extrinsic goal content were rated on a 7-point scale from 1 (not at all) to 7 (very much), and specificity was rated on a scale from 1 (very specific) to 7 (very broad). All other items were rated using the same scale: participants were asked to indicate their agreement with each statement on a scale of 1 (strongly disagree) to 7 (strongly agree).<sup>5</sup> When a goal characteristic was assessed using more than one item, a mean of the ratings was computed.

*Goal progress.* Goal progress for each goal was assessed at the second time point using the item: "I have made a lot of progress towards this goal" (Koestner et al., 2008), using a scale ranging from 1 (strongly disagree) to 7 (strongly agree).

## ANALYTIC PLAN

Sample descriptive statistics and reliability estimates for the measures were calculated with IBM SPSS Statistics Software (Version 23) and R (omega values were calculated using the multilevelTools package), as well as means, standard deviations, and correlations for all study variables. Using Multilevel

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4. As pre-registered, since autonomous and controlled motivation were correlated at less than  $-.30$  ( $r = -.06$ ), they were conceptualized as separate dimensions. They were also kept separate in Studies 2 and 3 for consistency.

5. The pre-registration indicated that each goal characteristic would be averaged across all participants' goals and standardized. However, this was a mistake, which is inconsistent with the plan to conduct multilevel analyses.

**TABLE 1. Items used to assess goal characteristics in Studies 1–3.**

<b>Goal characteristic</b>	<b>Item(s)</b>	<b>Reference(s)</b>
Autonomous motivation	<p>“Because of the fun and enjoyment which the goal will provide you—the primary reason is simply your interest in the experience itself” (intrinsic motivation);</p> <p>“Because it represents who you are and reflects what you value most in life” (integrated motivation);</p> <p>“Because you really believe that it is an important goal to have—you endorse it freely and value it wholeheartedly” (identified motivation)</p>	Koestner et al., 2015; Sheldon & Kasser, 1998
Controlled motivation	<p>“Because you would feel ashamed, guilty, or anxious if you didn’t—you feel that you ought to strive for this” (introjected motivation);</p> <p>“Because somebody else wants you to, or because you’ll get something from somebody if you do” (external motivation)</p>	Koestner et al., 2015; Sheldon & Kasser, 1998
Approach motivation	“To get closer to something you want”	Werner et al., 2020
Avoidance motivation	“To avoid negative consequences of not pursuing this goal”	Werner et al., 2020
Intrinsic goal content	<p>“To what extent does [your goal] help you to achieve the following possible futures?”</p> <p>“Self-acceptance and personal growth: being happy and living a very meaningful life”;</p> <p>“Intimacy and friendship: having many close and caring relationships with others”;</p> <p>“Societal contribution: working to help make the world a better place”</p>	Hope et al., 2016; Kasser & Ryan, 1996
Extrinsic goal content	<p>“To what extent does [your goal] help you to achieve the following possible futures?”</p> <p>“Financial success: having a job that pays very well and having a lot of nice possessions”;</p> <p>“Fame and recognition: being known and admired by many people”;</p> <p>“Physical appearance: looking good and being attractive to others”</p>	Hope et al., 2016; Kasser & Ryan, 1996
Commitment	<p>“I feel that I am committed to this goal” (Study 1)</p> <p>Or “How committed do you feel toward this goal?” (Studies 2 and 3)</p>	Milyavskaya et al., 2015
Specificity	“Goals can range from being very specific (e.g., smile at someone on the way to work today) to very broad (e.g., be a good person). How would you define the current goal you are pursuing?”	Designed for the study
Self-efficacy	<p>“I feel that I have the skills and resources necessary to attain this goal” (Study 1)</p> <p>Or “To what extent do you feel you have the skills and resources necessary to attain this goal?” (Studies 2 and 3)</p>	Sheldon & Kasser, 1998
Difficulty	<p>“I think it will be difficult for me to reach this goal” (Study 1)</p> <p>Or “How challenging do you think it will be to attain this goal?” (Studies 2 and 3)</p>	Sheldon & Kasser, 1998
Implementation intentions	“I have made specific plans for how, when and where to reach this goal”	Milyavskaya & Nadolny, 2018
Perception of others’ support	“Others are supporting me on this goal”	Designed for the study
Goal conflict	“Pursuing this goal conflicts or interferes with my other goals”	Modified for the study, Boudreaux & Ozer, 2013
Goal facilitation	“Pursuing this goal will have a helpful effect on my other goals”	Modified for the study, Boudreaux & Ozer, 2013
Importance	“How important is this goal to you?”	Holding et al., 2017
Intended effort	“How hard do you intend to try at this goal?”	Sheldon & Elliot, 1998

Modeling (MLM), the proportion of within-person variance to the proportion of between-person variance was estimated by calculating intraclass correlation coefficients. To examine our main research question, Multilevel Modeling (MLM) was conducted using the MIXED procedure in SPSS. Goals were nested within-person; goal characteristics and goal progress were entered as within-person variables (level 1) and depressive symptoms as a between-person variable (level 2). Separate models were created for each goal characteristic. If any characteristics were significantly correlated at higher than .80, we planned to create a construct collapsing across those characteristics in subsequent analyses. Each model included a goal characteristic as a level 1 predictor, depressive symptoms as a level 2 predictor, and their interaction as predictors of goal progress. The measure of depressive symptoms was grand-mean centered, and each goal characteristic variable was person-mean centered. The model including autonomous motivation as a goal characteristic controlled for controlled motivation, and vice versa. The same was done for models including approach and avoidance motivation, extrinsic and intrinsic goal content, and goal conflict and facilitation. To further examine the strength of the evidence in favor of the null hypothesis for the interaction terms, Bayes Factors were calculated using the Bayesian Information Criteria (BIC) from the SPSS output (Raftery, 1995; Wagenmakers, 2007).

## RESULTS

### PRELIMINARY ANALYSES

Participants reported an average of 7.35 goals ( $SD = 3.31$ , range = 2 to 16), for a total of 926 goals analyzed in this study. Preliminary analyses showed significant correlations among goal characteristics (see Table 2 for means and correlations among variables). None of the goal characteristics were correlated at higher than .80 at the within-person level; they were thus kept separate in subsequent analyses. Intraclass correlation coefficients indicated that 21% to 43% of the variance in goal characteristics and 12% of the variance in goal progress was accounted for by differences at the between-person level, whereas 57% to 88% of the variance was accounted for by differences at the within-person level (i.e.,

TABLE 2. Study 1: Descriptive statistics and correlations among variables.

Variable	M	SD	ICC	Within-Persons Correlations															
				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Depressive symptoms	8.58	6.22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Autonomous motivation	5.25	.79	.24	.05	—	-.15***	.07†	-.22***	.45***	.12**	.30***	.05	.03	.04	.09*	.15***	-.06	.06	.03
3. Controlled motivation	3.56	1.14	.33	.09	.03	—	.21***	.52***	-.04	.05	.03	-.01	-.02	.12**	.10**	.26***	.08*	.09*	.08*
4. Approach motivation	5.69	1.05	.21	.09	.44***	.25*	—	.34***	.04	.29***	.12**	-.002	.03	.14***	.20***	.25***	.01	.28***	.04
5. Avoidance motivation	4.78	1.33	.20	.16	.14	.51***	.46***	—	-.09*	.18***	.04	.05	.01	.13***	.10**	.15***	-.05	.28***	.13***
6. Intrinsic goal content	4.28	1.05	.34	.21*	.65***	.18	.54***	.21	—	.26***	.09*	.15***	-.06†	.09*	-.05	.11**	-.14***	.20***	.04
7. Extrinsic goal content	2.98	1.05	.43	.19*	.48***	.30**	.46***	.13	.83***	—	.03	.08*	-.06†	.14***	.06	.10**	-.004	.17***	.04
8. Commitment	5.69	.82	.24	-.16	.53***	-.10	-.01	-.15	.02	-.04	—	-.13***	.39***	-.11**	.48***	.25***	-.10**	.15***	.24***
9. Specificity	3.10	1.12	.21	.24*	-.03	.36**	.20	.14	.23†	.17	-.39**	—	-.09*	.08*	-.21***	-.05	-.04	.07*	-.01
10. Self-efficacy	5.81	.85	.30	-.30**	.13	-.08	√.25*	-.11	-.23*	-.17	.57***	-.27*	—	-.21***	.30***	.16***	-.04	.01	.17***
11. Difficulty	4.67	1.18	.23	.23*	.25*	.09	.42***	.30*	.37**	.31**	-.11	.09	-.37**	—	-.04	.05	.07*	.09*	-.17***
12. Implementation intentions	4.63	1.12	.25	-.08	.53***	-.03	.13	-.04	.04	.06	.78***	-.44***	.54***	-.14	—	.32***	-.001	.10**	.22***
13. Perception of others' support	5.39	1.13	.29	-.18†	.34**	.02	-.001	-.35**	.26*	.12	.21	.19	.13	.02	.12	—	.02	.11**	.12**
14. Goal conflict	2.89	1.44	.43	.20*	.09	.27*	-.01	-.09	.15	.21*	-.04	.27*	-.06	.24*	.16	.23*	—	-.24***	-.03
15. Goal facilitation	5.45	.94	.22	-.09	.62***	-.14	.42***	.13	.43***	.26*	.32**	-.22	.14	.11	.26*	.26*	-.22†	—	.09*
16. Goal progress	4.65	.98	.12	-.14	-.05	-.01	-.17	-.03	-.16	-.09	.44**	-.51***	.32*	-.18	.48***	-.10	-.20	.05	—

Note: Coefficients below the diagonal represent between-persons correlations, coefficients above the diagonal represent within-persons correlations. ICC = Intraclass correlation coefficients (proportion of variance at between-person level).

†p < .08. \*p < .05. \*\*p < .01. \*\*\*p < .001.

between goals). Model comparisons were conducted to determine if the slope of the level 1 predictor should be fixed or random; see Supplementary Appendix A for the results of which model was retained.

## MAIN ANALYSES

Results indicate that the main effect of depressive symptoms on goal progress was nonsignificant,  $b = -.01$ ,  $SE = .01$ ,  $t = -1.01$ ,  $p = .32$ , 95% CI  $[-.04, .01]$ . As can be seen in Table 3, there were significant main effects for the following goal characteristics: avoidance motivation, commitment, self-efficacy, difficulty, implementation intentions, perception of others' support, and goal facilitation. The main effect of controlled motivation was marginally significant. The only significant interaction was the one between depressive symptoms and goal facilitation. Figure 1 presents all interactions.

Overall, there was strong to very strong evidence for the null hypotheses (i.e., that each of the goal characteristics did not interact with depressive symptoms to predict goal progress), with Bayes Factors ranging from 17.64 to 68.51. However, the model with goal facilitation had a Bayes Factor of 1.39, suggesting that the evidence in favor of the null for this model is only anecdotal (Jarosz & Wiley, 2014; see Table 3). We also conducted additional exploratory analyses with the sample split into individuals with no depressive symptoms and those with moderate to severe depressive symptoms (see Supplementary Appendix B for details).

## DISCUSSION

The results of this study indicate that the kinds of goals pursued did not make a significant difference in the relationship between depressive symptoms and goal progress. Surprisingly, depressive symptoms were not significantly related to goal progress, and were unrelated to several goal characteristics. However, the power to detect this main effect was low, due to the 44.4% completion rate at the second time point. We thus sought to conduct further studies with larger samples. We also wanted to examine whether the timing between baseline and

TABLE 3. Study 1: Results.

Goal characteristic	Main Effect			Interaction with Depressive Sx			BIC (with interaction)	BIC (no interaction)	BF		
	Est.	SE	t	95% CI	Est.	SE				t	95% CI
Autonomous motivation	.05	.06	.95	[-.06, .16]	-.002	.01	-.23	[-.02, .02]	3639.508	3632.004	42.606
Controlled motivation	.10	.05	1.94 <sup>†</sup>	[-.003, .20]	-.001	.01	-.18	[-.02, .01]	3646.314	3638.536	48.862
Approach motivation	-.003	.04	-.07	[-.08, .08]	-.004	.01	-.65	[-.01, .01]	3634.060	3625.957	57.484
Avoidance motivation	.11	.03	3.40 <sup>**</sup>	[.05, .18]	-.003	.005	-.62	[-.01, .01]	3634.411	3625.957	68.511
Intrinsic goal content	.04	.05	.80	[-.06, .14]	-.004	.01	-.47	[-.02, .01]	3642.545	3634.834	47.252
Extrinsic goal content	.06	.06	1.02	[-.05, .17]	-.004	.01	-.43	[-.02, .01]	3642.285	3634.834	41.492
Commitment	.34	.05	6.97 <sup>***</sup>	[.25, .44]	-.01	.01	-1.30	[-.03, .01]	3592.187	3586.084	21.147
Specificity	-.01	.04	-.14	[-.08, .07]	.003	.01	.48	[-.01, .02]	3641.797	3633.766	55.451
Self-efficacy	.30	.07	4.58 <sup>***</sup>	[.17, .43]	-.01	.01	-.80	[-.03, .01]	3622.982	3616.207	29.592
Difficulty	-.19	.05	-3.85 <sup>***</sup>	[-.29, -.09]	.01	.01	.65	[-.01, .02]	3611.928	3604.598	39.056
Implementation intentions	.24	.04	6.32 <sup>***</sup>	[.17, .32]	-.004	.01	-.61	[-.02, .01]	3599.429	3591.407	55.202
Perception of others' support	.14	.04	3.31 <sup>**</sup>	[.06, .23]	-.001	.01	-.14	[-.01, .01]	3630.859	3622.626	61.344
Goal conflict	-.02	.05	-.29	[-.12, .09]	.01	.01	1.48	[-.004, .03]	3644.381	3638.641	17.637
Goal facilitation	.13	.06	2.14 <sup>*</sup>	[.01, .24]	-.02	.01	-2.68 <sup>**</sup>	[-.04, -.01]	3630.599	3629.935	1.394

Note: The main effect of each goal characteristic on goal progress is first reported, followed by the interactions. Depressive Sx = Depressive symptoms; BIC = Bayesian Information Criteria; BF = Bayes Factor. The Bayes Factor (evidence in favor of the null hypothesis) is calculated from the difference score between the two BICs,  $BF_{01} = \exp(\Delta BIC_{10}/2)$ , where  $\Delta BIC_{10} = BIC_{H1} - BIC_{H0}$ .

<sup>†</sup> $p < .08$ . <sup>\*</sup> $p < .05$ . <sup>\*\*</sup> $p < .01$ . <sup>\*\*\*</sup> $p < .001$ .



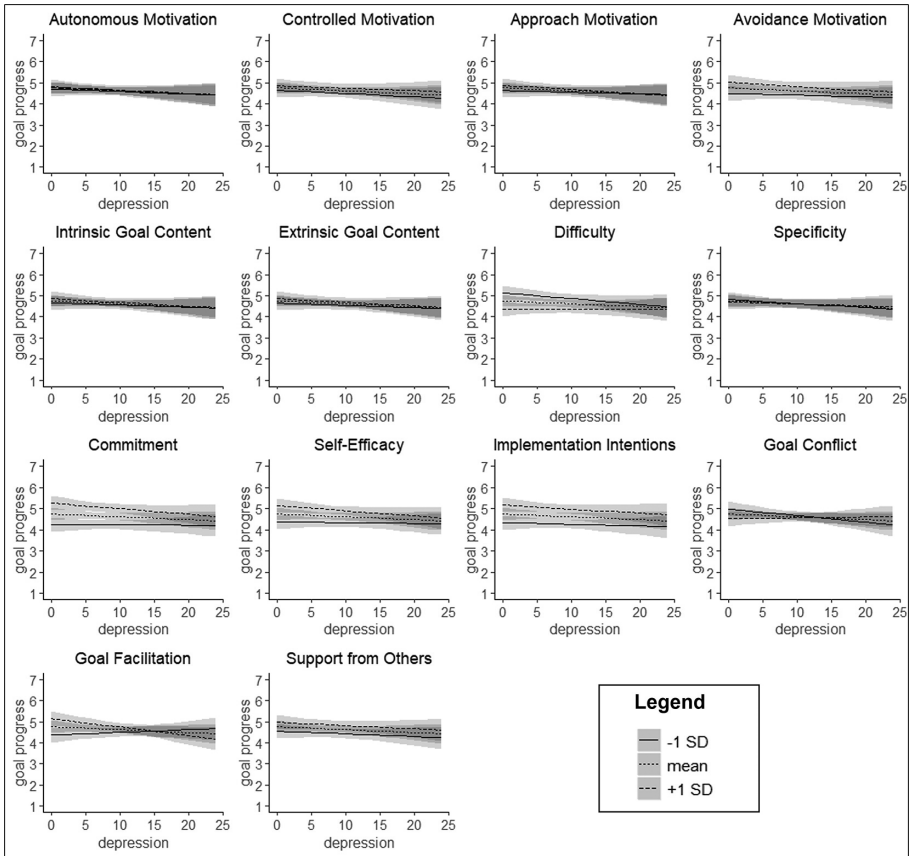


FIGURE 1. Study 1: Interactions between depressive symptoms and goal characteristics on goal progress.

Note. A color version of this figure is available online at <https://osf.io/kzgv4/>.

follow-up would impact the results, by looking at these relationships over longer time intervals.

### STUDY 2

The second study included two time points separated by an interval of 4 months. First, participants' depressive symptoms were measured, and they were asked to assess the characteristics of three goals they were pursuing. Goal progress was assessed 4

months later. Based on the results of Study 1, we expected that none of the goal characteristics would moderate the relationship between depressive symptoms and goal progress.

## METHOD

### PARTICIPANTS

Participants were 191 university students recruited from a large Canadian university through on-campus advertisements for a study on personal goals. They received \$50 for participating in the study. The data from 5 participants were excluded because they did not complete the measure of depressive symptoms. The completion rate at the last time point was 93% (13 participants did not complete any measure of goal progress at the last time point). The final sample thus consisted of 173 participants (132 female, 41 male; aged 17 to 47 [ $M = 20.89$  years old,  $SD = 3.29$ ]; 50.9% Caucasian, 23.7% Asian/Pacific Islander, 21.4% other, 1.7% Hispanic/Latino, and 0.6% Black/African American).

### PROCEDURE

Participants were invited to participate in an online study of personal goals. Though the full study included a total of six time points over the academic year, only two (T3 and T6) were used for the purposes of this study. At the start of the year, participants were asked to list three personal goals they planned to pursue over the course of the academic year, using Koestner and colleagues' (2008) description. They were later asked to rate the characteristics of each goal, and their depressive symptoms were assessed. Four months later, participants were asked to report on their progress for each goal. They were given one week to complete each survey after receiving the link.

### MEASURES

*Depressive Symptoms.* The Center for Epidemiologic Studies Depression Scale Revised (CESD-R-10; Andresen et al., 1994) was used to assess depressive symptoms. The CESD-R-10 is a

10-item self-report measure of depressive symptoms (e.g., “I felt depressed”; “My sleep was restless”). Participants were asked to rate each item on a scale of 0 (rarely or none of the time, less than 1 day) to 3 (all of the time, 5–7 days). Items 5 and 8 were reverse-coded. A sum of the 10 items was computed ( $\alpha = .85$ ).

*Goal Characteristics.* The following characteristics were assessed for each goal: autonomous ( $\omega_{\text{within}} = .68$ ,  $\omega_{\text{between}} = .93$ ) and controlled motivation ( $\omega_{\text{within}} = .58$ ,  $\omega_{\text{between}} = .74$ ), approach and avoidance motivation, commitment, self-efficacy, difficulty, intended effort, and importance (see Table 1). The 7 items assessing motivation were rated on a scale of 1 (strongly disagree) to 7 (strongly agree), and all other items used a scale ranging from 1 (not at all) to 7 (extremely).

*Goal Progress.* Goal progress for each goal was assessed using the following items: “I have made a lot of progress towards this goal”; “I feel like I am on track with my goal plan”; “I feel like I have achieved this goal” (Hope et al., 2016; Milyavskaya et al., 2015). Each item was rated using a scale ranging from 1 (strongly disagree) to 7 (strongly agree). Ratings on these three items were averaged ( $\omega_{\text{within}} = .93$ ,  $\omega_{\text{between}} = .89$ ).

## ANALYTIC PLAN

The same analytic plan was used as in Study 1.

## RESULTS

### PRELIMINARY ANALYSES

Participants reported a total of 519 goals that were analyzed in this study. Preliminary analyses showed significant correlations among goal characteristics (see Table 4 for means and correlations among variables). None of the goal characteristics were correlated at higher than .80 at the within-person level; they were thus kept separate in subsequent analyses. Intraclass correlation

TABLE 4. Study 2: Descriptive statistics and correlations among variables.

Variable	M	SD	ICC	Within-Persons Correlations																
				1	2	3	4	5	6	7	8	9	10	11						
1. Depressive symptoms	12.54	6.13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Autonomous motivation	5.23	.93	.29	-.15	—	-.26***	.16**	-.30***	.27***	.24***	-.23***	.16**	-.27***	.10†	—	—	—	—	—	—
3. Controlled motivation	3.59	1.24	.36	.41***	.05	—	.001	.43***	-.08	-.09	.19***	.02	.04	.01	—	—	—	—	—	—
4. Approach motivation	5.61	1.06	.20	-.01	.68***	.38*	—	.29***	.26***	.07	.22***	.29***	.36***	.15**	—	—	—	—	—	—
5 Avoidance motivation	4.57	1.44	.23	.36**	.29	.86***	.52**	—	.07	-.08	.27***	.21***	.19***	.05	—	—	—	—	—	—
6. Commitment	5.32	.94	.22	-.33**	.68***	.08	.64***	.13	—	.31***	.04	.70***	.56***	.40***	—	—	—	—	—	—
7. Self-efficacy	5.18	.98	.25	-.54***	.62***	-.32*	.33†	-.25	.78***	—	-.33***	.16**	.11*	.18***	—	—	—	—	—	—
8. Difficulty	5.41	.98	.16	.21	.56*	.34*	.69***	.47**	.25	.28	—	.16**	.18***	-.19***	—	—	—	—	—	—
9. Intended effort	5.44	.92	.24	-.17	.63***	.04	.55***	.02	.95***	.79***	.22	—	.57***	.33***	—	—	—	—	—	—
10. Importance	5.74	.86	.28	-.09	.78***	.14	.79***	.27†	.85***	.68***	.65***	.77***	—	.23***	—	—	—	—	—	—
11. Goal progress	4.41	1.13	.11	-.22	.36†	-.14	.39	-.15	.41*	.58**	.30	.55**	.29	—	—	—	—	—	—	—

Note. Coefficients below the diagonal represent between-persons correlations; coefficients above the diagonal represent within-persons correlations. ICC = Intraclass correlation coefficients (proportion of variance at between-person level).

†p < .08. \*p < .05. \*\*p < .01. \*\*\*p < .001.

coefficients indicate that between 16% and 36% of the variance in goal characteristics and 11% of goal progress was accounted for by differences at the between-person level, whereas 64% to 89% of the variance was accounted for by differences at the within-person level (i.e., between goals). Model comparisons were conducted to determine if the slope of the level 1 predictor should be fixed or random. See Supplementary Appendix A for the results of which model was retained.

## MAIN ANALYSES

Results indicate that the main effect of depressive symptoms on goal progress was nonsignificant,  $b = -.02$ ,  $SE = .01$ ,  $t = -1.51$ ,  $p = .133$ , 95% CI  $[-.05, .01]$ . As can be seen in Table 5, there were significant main effects for approach motivation, commitment, self-efficacy, difficulty, intended effort, and importance. The interactions between depressive symptoms and avoidance motivation as well as self-efficacy were significant, and the one with controlled motivation was marginally significant. See Figure 2 for all interactions.

Overall, there was substantial to very strong evidence for the null hypotheses (i.e., that there was no interaction between each goal characteristic and depressive symptoms on progress), with Bayes Factors ranging from 7.59 to 35.09. However, the models with avoidance motivation and self-efficacy had Bayes Factors of 1.38 and 3.39 (respectively), suggesting that the evidence in favor of the null for these models is only anecdotal (see Table 5).

## DISCUSSION

The results of this study seem to partially replicate the findings in Study 1, such that depressive symptoms did not significantly impact goal progress, and most interactions with goal characteristics were nonsignificant. However, most goal characteristics did significantly relate to goal progress, as would be expected from prior research (Milyavskaya & Werner, 2018).

TABLE 5. Study 2: Results.

Goal characteristic	Main Effect			Interaction with Depressive Sx					BF		
	Est.	SE	t	95% CI	Est.	SE	t	95% CI		BIC (with interaction)	BIC (no interaction)
Autonomous motivation	.15	.10	1.54	[-.04, .35]	-.01	.02	-.87	[-.05, .02]	2095.861	2090.174	17.176
Controlled motivation	.05	.07	.71	[-.09, .20]	.02	.01	1.76 <sup>†</sup>	[-.002, .04]	2091.904	2087.850	7.591
Approach motivation	.20	.08	2.50*	[.04, .36]	.02	.01	1.58	[-.01, .04]	2096.909	2092.452	9.286
Avoidance motivation	-.003	.05	-.06	[-.10, .10]	.02	.01	2.68**	[.01, .04]	2086.856	2086.214	1.379
Commitment	.55	.07	8.09***	[.42, .68]	.004	.01	.36	[-.02, .02]	2036.497	2029.381	35.093
Self-efficacy	.26	.07	3.62***	[.12, .39]	-.02	.01	-2.20*	[-.04, -.002]	2078.983	2076.543	3.387
Difficulty	-.23	.06	-3.74***	[-.35, -.11]	.01	.01	1.18	[-.01, .03]	2081.995	2075.969	20.348
Intended effort	.53	.09	5.98***	[.35, .70]	.02	.01	1.29	[-.01, .05]	2053.922	2048.838	12.705
Importance	.37	.09	4.22***	[.20, .54]	.01	.02	.37	[-.02, .04]	2077.330	2071.598	17.567

Note. The main effect of each goal characteristic on goal progress is first reported, followed by the interactions. Depressive Sx = Depressive symptoms; BIC = Bayesian Information Criteria; BF = Bayes Factor. The Bayes Factor (evidence in favor of the null hypothesis) is calculated from the difference score between the two BICs,  $BF_{01} = \exp(\Delta BIC_{10}/2)$ , where  $\Delta BIC_{10} = BIC_{H1} - BIC_{H0}$ .

<sup>†</sup> $p < .08$ . \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

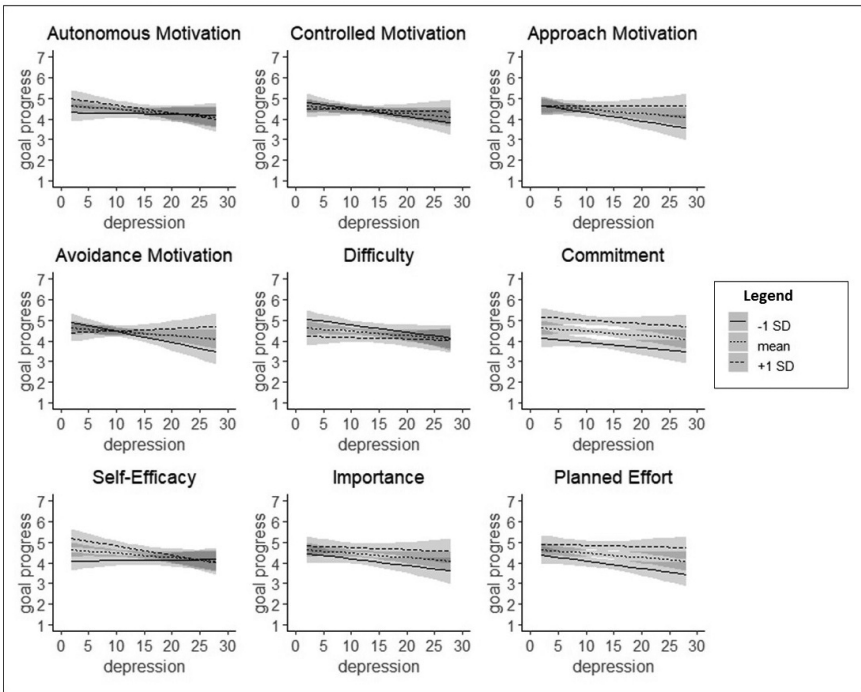


FIGURE 2. Study 2: Interactions between depressive symptoms and goal characteristics on goal progress.

Note. A color version of this figure is available online at <https://osf.io/kzgv4/>.

### STUDY 3

The third study included two time points over a period of 8 months. At the first time point, participants' depressive symptoms were assessed, and they were asked to list three goals they were pursuing and assess their characteristics. Goal progress was assessed 8 months later. Based on the results of Studies 1 and 2, we expected no significant interactions between depressive symptoms and goal characteristics.

## METHOD

### PARTICIPANTS

Participants were 425 university students recruited from a large Canadian university through on-campus advertisements for a study on personal goals. They were compensated \$50 for participating in the study. The data from 2 participants were excluded because they did not complete the measure of depressive symptoms. The completion rate at the last time point was 86.8% (56 participants did not complete any measure of goal progress at the last time point). The final sample thus consisted of 367 participants (288 female, 78 male, 1 transgender; aged 17 to 37 [ $M = 20.30$  years old,  $SD = 2.40$ ]; 58.9% Caucasian and 30.8% Asian/Pacific Islander, 4.9% other, 3% Black/African American, and 2.5% Hispanic/Latino).

### PROCEDURE

A similar procedure to Study 2 was followed. At the first time point, participants were asked to list three goals they planned to pursue over the course of the academic year and were asked to rate the characteristics of each goal. Their depressive symptoms were also assessed at this time. Participants reported on their progress for each goal 3 and 8 months later (we did not initially plan to analyze data from the 3-month time point, thus any results from those analyses should be considered exploratory).

### MEASURES

Depressive symptoms ( $\alpha = .76$ ) and goal progress ( $\omega_{\text{within}} = .94$ ,  $\omega_{\text{between}} = .96$ ) were assessed in the same manner as in Study 2.

*Goal Characteristics.* The following characteristics were assessed for each goal: autonomous ( $\omega_{\text{within}} = .62$ ,  $\omega_{\text{between}} = .86$ ) and controlled motivation ( $\omega_{\text{within}} = .47$ ,  $\omega_{\text{between}} = .62$ ), commitment, self-efficacy, difficulty, implementation intentions, intended effort, and importance (see Table 1). The 5 items assessing autonomous and controlled motivation were rated on a scale of 1 (not at all for



this reason) to 7 (completely for this reason), and all other items used a scale ranging from 1 (not at all) to 7 (extremely).

## ANALYTIC PLAN

The same analytic plan was used as in Studies 1 and 2.

## RESULTS

### PRELIMINARY ANALYSES

Participants reported a total of 1,101 goals that were analyzed in this study. Preliminary analyses showed significant correlations among goal characteristics (see Table 6 for means and correlations among variables). None of the goal characteristics were correlated at higher than .80; they were thus kept separate in subsequent analyses. Intraclass correlation coefficients indicate that between 13% and 27% of the variance in goal characteristics was accounted for by differences at the between-person level, whereas 73% to 87% of the variance was accounted for by differences at the within-person level (i.e., between goals). Model comparisons were conducted to determine if the slope of the level 1 predictor should be fixed or random. See Supplementary Appendix A for the results of which model was retained.

### MAIN ANALYSES

Results indicate that there was a significant main effect of depressive symptoms on goal progress at 8 months,  $b = -.04$ ,  $SE = .01$ ,  $t = -2.85$ ,  $p = .005$ , 95% CI  $[-.07, -.01]$ . There were also significant main effects for commitment and intended effort (see Table 7). All interactions were nonsignificant, although the one between depressive symptoms and self-efficacy was marginally significant. See Figure 3 for all interactions.

Overall, there was strong to very strong evidence for the null hypothesis of no interaction, with Bayes Factors ranging from 19.16 to 35.89. However, the model with self-efficacy had a

TABLE 6. Study 3: Descriptive statistics and correlations among variables.

Variable	M	SD	ICC	Within-Persons Correlations													
				1	2	3	4	5	6	7	8	9	10	11			
1. Depressive symptoms	10.17	4.88	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2. Autonomous motivation	5.25	.89	.19	-.23**	—	—	.31***	.10**	.21***	-.16***	-.33***	—	—	.56***	.05	—	.07
3. Controlled motivation	3.17	1.12	.27	.52***	.09	—	-.03	-.01	.03	.22***	.05	.05	—	-.11**	.06	.00	.00
4. Commitment	5.59	.77	.17	-.42***	.71***	-.23†	—	.26***	.71***	-.002	.54***	.47***	—	.41***	.20***	.07	.07
5. Self-efficacy	5.32	.95	.23	-.53***	.53***	-.18	.63***	—	.17***	-.28***	.10**	.16***	.16***	—	.29***	.07	.07
6. Difficulty	5.54	.97	.13	-.31**	.71***	-.24	.81***	.51***	—	.12**	.55***	.42***	.42***	—	.17***	.17***	.17***
7. Implementation intentions	4.41	1.05	.19	.33***	.27†	.13	.09	-.26*	.26	—	.18***	.02	.02	.02	—	-.03	-.03
8. Intended effort	5.72	.71	.13	.10	.66***	.10	.54***	.14	.38*	.62***	—	.59***	.27***	.27***	—	.08†	.08†
9. Importance	5.99	.70	.13	-.08	.66***	.001	.75***	.31*	.64***	.40*	.76***	—	.22***	.22***	.22***	—	.02
10. Goal progress (3 months)	3.99	1.04	.19	-.31***	.59***	-.27*	.45***	.35***	.46***	.04	.21	.38*	.38*	.38*	—	.07†	.07†
11. Goal progress (8 months)	4.60	1.44	.21	-.24**	.18	.05	.25†	.46***	.24	-.22	.06	.25	.46**	.46**	.46**	—	—

Note: Coefficients below the diagonal represent between-persons correlations, coefficients above the diagonal represent within-persons correlations, ICC = Intraclass correlation coefficients (proportion of variance at between-person level).

†p < .08. \*p < .05. \*\*p < .01. \*\*\*p < .001.

TABLE 7. Study 3: Results.

Goal characteristic	Main Effect			Interaction with Depressive Sx			BIC (with interaction)	BIC (no interaction)	BF	
	Est.	SE	t	95% CI	Est.	SE				t
Autonomous motivation	.10	.06	1.66	[-.02, .23]	-.01	.01	-1.07	[-.04, .01]	3653.428	19.163
Controlled motivation	.04	.05	.72	[-.07, .14]	-.01	.01	-.88	[-.03, .01]	3653.428	25.907
Commitment	.29	.07	4.46***	[.16, .42]	.01	.01	.80	[-.02, .04]	3632.445	20.884
Self-efficacy	.08	.06	1.39	[-.03, .19]	.02	.01	1.78*	[-.002, .04]	3650.338	6.865
Difficulty	-.04	.05	-.80	[-.15, .06]	-.01	.01	-.77	[-.04, .01]	3651.774	26.193
Implementation intentions	.07	.05	1.45	[-.02, .16]	.004	.01	.36	[-.02, .02]	3650.523	35.891
Intended effort	.25	.07	3.71***	[.12, .38]	.01	.01	.48	[-.02, .03]	3638.357	26.562
Importance	.10	.07	1.43	[-.04, .24]	.001	.02	.06	[-.03, .03]	3649.826	26.496

Note. The main effect of each goal characteristic on goal progress is first reported, followed by the interactions. Depressive Sx = Depressive symptoms; BIC = Bayesian Information Criteria; BF = Bayes Factor. The Bayes Factor (evidence in favor of the null hypothesis) is calculated from the difference score between the two BICs,  $BF_{01} = \exp(\Delta BIC_{10}/2)$ , where  $\Delta BIC_{10} = BIC_{H1} - BIC_{H0}$ .

\* $p < .08$ . \*\* $p < .05$ . \*\*\* $p < .001$ .

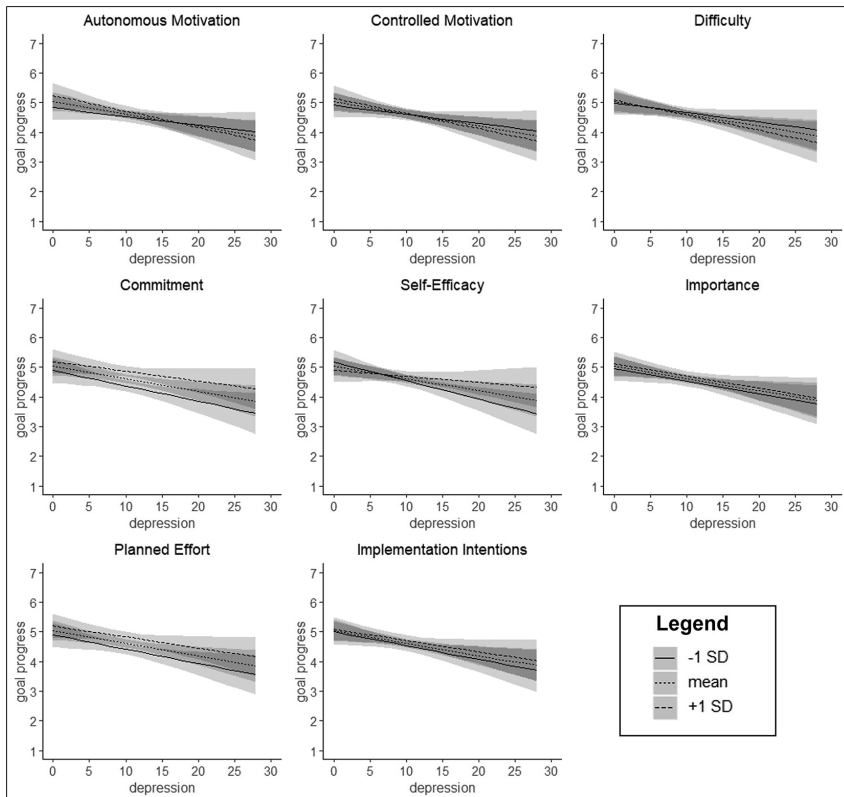


FIGURE 3. Study 3: Interactions between depressive symptoms and goal characteristics on goal progress.

Note. A color version of this figure is available online at <https://osf.io/kzgv4/>.

Bayes Factor of 6.87, suggesting that the evidence in favor of the null for this model is substantial (Jarosz & Wiley, 2014; see Table 7).

We were also interested in whether the time frame of measurement matters, as part of supplementary analyses. In addition to assessing goal progress at 8 months, the study also included a measure of goal progress 3 months after the initial survey. The main effect of depressive symptoms on goal progress remained significant at 3 months,  $b = -.03$ ,  $SE = .01$ ,  $t = -2.72$ ,  $p = .007$ , 95% CI  $[-.05, -.01]$ . There were also main effects for every goal characteristic except controlled motivation, and a marginally significant

interaction between importance and depressive symptoms (see Table C1 in Supplementary Appendix C).

## DISCUSSION

Contrary to Studies 1 and 2, depressive symptoms did significantly predict goal progress in Study 3, both at three and eight months. However, as in prior studies, none of the goal characteristics seemed to buffer this negative effect.

## META-ANALYSIS

Though we did not specify any hypotheses regarding the effect of depressive symptoms on goal progress as part of our pre-registration, we were surprised that this main effect was not significant in two of the three studies. We thus decided to do a mini meta-analysis of this effect across the three studies, using Goh and colleagues' (2016) method. Correlation coefficients were used for each study. We used random effects in which the mean effect size (i.e., mean correlation) was weighted by sample size. All correlations were Fisher's  $z$  transformed for analyses and converted back to Pearson correlations for presentation. Results indicate a small significant effect of depressive symptoms on goal progress,  $M r = -.16$ ,  $z = -4.16$ ,  $p < .001$ , 95% CI  $[-.23, -.09]$ .

## GENERAL DISCUSSION

Across three studies, this article examined potential moderators in the relationship between depressive symptoms and goal progress, looking at up to 16 goal characteristics identified as relevant as they are differentially related to goal progress in the existing literature. An internal meta-analysis across the three studies indicated that there was a small negative effect of depressive symptoms on goal progress. Many goal characteristics were significantly related to goal progress; the effects of commitment and intended effort were significant across all studies in which they were assessed. Most interactions were nonsignificant, with Bayes Factors suggesting substantial to very strong evidence in

favor of the null hypothesis. Some of the interactions with goal facilitation (in Study 1), avoidance motivation (in Study 2), and self-efficacy (in Study 2) as moderators were significant, but these effects were not consistent across all studies.

Interestingly, the meta-analysis found a small negative effect of depressive symptoms on goal progress, despite the effect being nonsignificant in Studies 1 and 2. Although the power to detect an effect was low in Study 1, it was adequate (over 80%) in Studies 2 and 3.<sup>6</sup> The nonsignificant main effects in Studies 1 and 2 may be partly explained by the examination of the intraclass correlation coefficients across the three studies, which suggest that most of the variance (between 57% and 89%) is at the within-person level, while depressive symptoms are measured at the between-person level. This is consistent with existing research suggesting that most of the variance in goal characteristics and attainment is at the within-person level, among the different goals of a given person, as opposed to differences between people (Milyavskaya & Werner, 2018). We also wondered whether the time elapsed between the measurement of variables mattered, such that depressive symptoms may not significantly impact goal progress over shorter periods of time (1 month in Study 1, and 4 months in Study 2), but the effect may instead be measurable over longer time intervals (8 months in Study 3). However, exploratory analyses in Study 3, where the effect of depressive symptoms was significant on goal progress at 3 months and 8 months, suggest that this may not be the case. Finally, though some research has examined the effect of depressive symptoms on progress on personal goals (e.g., Moss & Cheavens, 2019; Moss-Pech et al., 2021), a large part of the literature focuses on specific outcomes (such as performance or behaviors; Hopko & Mullane, 2008), or on specific domains (e.g., academic and occupational, or social and interpersonal; Locke et al., 2017; Ritschel & Sheppard, 2018). Ultimately, the results of the meta-analysis suggest that in samples of university students, though the presence of mild to moderate depressive symptoms may interfere with goal pursuits, the effect is likely to be small.

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6. Post hoc power analyses indicate that Study 1 ( $N = 126$ ) had 35% power to detect an effect of  $r = -.14$  between depressive symptoms and goal progress; Study 2 ( $N = 173$ ) had 84% power to detect an effect of  $r = -.22$ ; and Study 3 ( $N = 367$ ) had 99% power to detect  $r = -.24$ .

Except for commitment and intended effort, which were consistently related to greater goal progress across all studies, other goal characteristics were inconsistently related to goal progress. The omega values at the within level for some of the goal characteristics were low, suggesting that there may be measurement error. Perhaps most surprisingly, the main effect of autonomous motivation on goal progress was non-significant in all three studies (although it was positive in all of them, and significantly related with goal progress at 3 months in Study 3). Despite many studies published showing this effect (e.g., Koestner et al., 2008; Milyavskaya et al., 2015), others have found only an indirect effect (e.g., Werner et al., 2016). And despite many studies finding effects of goal characteristics on goal pursuit (for an overview, see Milyavskaya & Werner, 2018), there is no cumulative base of evidence (i.e., a meta-analysis) examining the relation between these characteristics and goal progress. Such cumulative evidence is necessary to provide a thorough understanding of the predictors of goal progress, and would allow researchers to see whether the effect sizes and results of any given study fall within the range of expected effects (and should, in turn, result in an updating of the cumulative evidence).

When testing our key research question, few interactions between depressive symptoms and goal characteristics were significant; in most cases, there was substantial to very strong evidence supporting the null hypothesis. The calculation of Bayes factors allowed us to test null effects directly, which is not feasible with the frequentist approach (Wagenmakers, 2007). This suggests that the effect of depression on goal progress does not differ based on the nature of the goal. Thus, the kinds of goals people pursue may not matter as much in the context of depression in that all goals are more or less negatively affected in the same manner. It is possible that if goal characteristics do not moderate the relationship between depressive symptoms and goal progress, mediation might alternatively be the mechanism at play. That is, depressive symptoms may affect the characteristics of the goals over time (e.g., the goals become less important, or increasingly pursued for controlled reasons), eventually leading to poorer goal progress. This would be consistent with recent research suggesting that depression predicts changes in commitment at two weeks, which in turn predicts lower goal achievement at two months (Moss & Cheavens, 2019). That research

indicates that depression and goal characteristics impact each other over time, suggesting that the timing of measurement of these variables matters—for example, Moss and Cheavens (2019) found that baseline depressive symptoms were not related to baseline goal commitment but did predict lower commitment two weeks later. The nature (e.g., moderation vs. mediation) and directionality of these relationships should be further clarified.

The studies discussed in this article build on existing research investigating the relationship between depressive symptoms, goal characteristics, and goal progress, which often includes correlational or cross-sectional studies, by examining these relationships over time using multilevel modeling, and examining potential moderators. Further research is warranted to better understand the mechanisms underlying the relationships among these variables, including longitudinal studies to investigate causality and directionality (e.g., do depressive symptoms predict changes in goal characteristics, or vice versa, or both?). Also, a portion of the existing literature seems to focus on depression as an outcome rather than a predictor, with poor goal progress or perceptions of inadequate progress predicting higher depressive symptoms (Moore et al., 2020; Street, 2002). More research is needed examining depression as a predictor, as well as the relationship with progress on personal goals, as opposed to specific outcomes or domains. Further, though it is not uncommon for research on depressive symptoms and goal pursuit to be conducted among university students (e.g., Moss & Cheavens, 2019, Moss-Pech et al., 2021), with studies showing higher rates of depressive symptoms among students than in the general population (Ibrahim et al., 2013), the predominantly white North American student samples included in our studies limits the generalizability of the findings. Future research should examine these relationships among more diverse as well as clinical samples. Finally, many goal characteristics were assessed using single items, and though this is commonly done in the study of personal goals (Sheldon & Kasser, 1998), and allowed us to assess a greater number of characteristics for multiple goals without significantly increasing participant burden, it does not provide robust measurement, which should be addressed in future research.

In conclusion, the studies discussed in this article suggest that depressive symptoms similarly affect progress on all goals regardless of the kinds of goals students set. There was a small



negative effect of depressive symptoms on goal progress, though not across all studies (including one with low power), suggesting that university students presenting depressive symptoms may still be able to make some progress on their goals. On one hand, this may provide a positive outlook for university students, among whom depressive symptoms are found to be a common occurrence (Ibrahim et al., 2013), as it suggests that their personal goals, regardless of their nature, may not be markedly negatively affected. On the other hand, it may point to a bleaker outlook, such that depressive symptoms impact all goals in the same manner, regardless of how well the goal is selected in its specificity, difficulty, commitment, or sense of enjoyment.

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