Goal Motivation and the Subjective Perception of Past and Future Obstacles

Isabelle Leduc-Cummings¹

McGill University

Marina Milyavskaya² and Johanna Peetz²

Carleton University

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Correspondence concerning this article should be addressed to Isabelle Leduc-Cummings, Department of Educational and Counselling Psychology, McGill University, 3700 McTavish Street, Montreal, Qc, Canada, H3A 1Y2. Contact: isabelle.leduc-cummings@mail.mcgill.ca

Abstract

Want-to (vs. *have-to*) motivation has been found to lead to more successful goal attainment and reports of fewer obstacles. However, to date, only correlational research has been conducted. The present research experimentally examines the effects of motivation on the subjective perception of the frequency and disruptiveness of obstacles, and explores whether the results differ based on time (past vs. future obstacles). In four studies, participants were randomly assigned to *want-to* or *have-to* motivation for the goal of eating healthy and reported on the frequency and disruptiveness of obstacles encountered in the past week or anticipated in the coming week. Time moderated the effect of motivation such that *want-to* motivation led to the perception of fewer and less disruptive obstacles, but only for future (not past) obstacles. The possible reasons for this discrepancy, and the implications for the relationship between *want-to* motivation and goal pursuit are discussed.

Keywords: goal pursuit, goal motivation, obstacles, past and future time frame

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Individuals set goals in almost all areas of their life, whether it be health (“lose weight”), work (“be more organized”), sports (“exercise one hour per day”), or relationships (“spend more time with my partner”). Unfortunately, although individuals commonly set goals, they also frequently fail to attain them (Sheldon & Elliot, 1999). One possible explanation for these failures is that people encounter obstacles along the way. For example, someone with the goal to lose weight might encounter obstacles such as feeling too tired to work out, having a lot of work to do, or having too much junk food in the house. But why is it that some people experience more obstacles, while others can progress smoothly towards their goals? In the present paper, we examine this question by looking at the role of goal motivation in the subjective perception of obstacles.

1.1 Goal Motivation

Previous research shows that motivation - the reasons why a goal is selected and pursued - influences goal pursuit (Koestner, Otis, Powers, Pelletier, & Gagnon, 2008; Sheldon & Elliot, 1998). Reasons for pursuing a goal include finding the goal interesting and enjoyable (intrinsic motivation), finding it important (identified motivation), because the goal has become a part of the individual’s core identity (integrated motivation), because of feelings of shame and obligation (introjected motivation), or because of external reasons (external motivation) (Ryan & Deci, 2000). Intrinsic, identified and integrated are forms of autonomous or *want-to* motivation, while controlled or *have-to* motivation encompasses introjected and external regulations (Deci and Ryan, 2008; Milyavskaya, Inzlicht, Hope, & Koestner, 2015). In other words, *want-to*

motivation can be understood as behaving with a full sense of volition and choice, while *have-to* motivation can be defined as arising from internal and external pressures (Deci & Ryan, 2008).¹

Want-to motivation is associated with positive outcomes including greater persistence, more positive affect, enhanced performance, and greater psychological well-being (Deci & Ryan, 2008). These benefits have been found across many domains such as school (e.g., Black & Deci, 2000), work (e.g., Fernet, Guay, & Senecal, 2004), and health (e.g., Pelletier, Dion, Slovenic-D'Angelo, & Reid, 2004). In particular, research consistently shows that *want-to* motivation is beneficial in goal pursuit, leading to more successful goal attainment (Koestner et al., 2008; Sheldon & Elliot, 1999). These positive effects of *want-to* motivation are still observed after controlling for several other measures of initial motivation (Sheldon & Elliot, 1998; 1999). Although the importance of *want-to* motivation for goal pursuit is well-established, the mechanisms for this relationship are not well understood. While initial research has suggested that *want-to* motivation is associated with overall greater sustained effort (Sheldon & Elliot, 1998), recent studies have proposed that *want-to* motivation is characterized by more automatic, effortless goal pursuit (Milyavskaya et al., 2015; Werner, Milyavskaya, Foxen-Craft & Koestner, in press; Note: the theoretical rationale for this is outside of the scope of the current paper, but can be found in Milyavskaya et al., 2015).

1.2 Obstacles

Recent research on the ease of goal pursuit shows that people report encountering fewer obstacles when pursuing goals for *want-to* reasons (Milyavskaya et al., 2015). Obstacles can be defined as “interfering forces that prevent people from reaching their goals” (Marguc, Forster, & Van Kleef, 2011, p.883). For example, living in a house where other family members regularly

¹ We chose to use the terms “*want-to*” and “*have-to*” to maintain consistency with previous work (Milyavskaya et al., 2015), and to make this article accessible to a wider audience beyond self-determination theory (SDT) researchers (by avoiding the specialized terms used by SDT).

buy junk food might be perceived as an obstacle for someone who has the goal of eating healthy. Obstacles have different properties and can thus be assessed in two ways: their frequency (i.e., the number of times they are encountered) and their disruptiveness (i.e., how strongly they interfere with the goal; Milyavskaya et al., 2015). Milyavskaya and colleagues (2015) found that *want-to* motivation was linked to individuals experiencing fewer obstacles, but not expending more or less effort on pursuing personally important goals. *Have-to* motivation showed the opposite pattern: it was associated with both greater obstacles and more effort. Consistent with previous research, they also found that *want-to* motivation led to better goal progress. Although *want-to* motivation was associated with reporting fewer obstacles, it is unclear whether this occurred because people actually encountered fewer obstacles, or because motivation influenced participants' subjective perception of obstacles such that fewer obstacles were perceived. For example, does someone with *want-to* motivation for eating healthy encounter fewer opportunities to indulge in unhealthy foods (e.g., receive fewer invitations to go out for fast food)? Or does (s)he subjectively re-interpret available opportunities to indulge in unhealthy food as an opportunity to showcase healthy eating (e.g., buying a salad as opposed to the Big Mac)? If the latter were true, the outing to the fast food restaurant would not be perceived as an obstacle or the obstacle would be perceived as easy to overcome.

Previous research has found that active goals (Higgins, 1996) influence cognitive processes including attention, evaluation, and memory (e.g., Ferguson & Bargh, 2004). Additionally, research has found that when a goal is activated, stimuli related to other competing goals become less salient (Shah, Friedman, & Kruglanski, 2002), and people automatically avoid temptation-related related words (Fishbach & Shah, 2006). In other words, having an activated goal results in automatic cognitive processes designed to promote effective goal pursuit.

However, that research has not considered the cognitive consequences of goal motivation (the reasons for goal pursuit) of the activated goal. The present research fills this void by experimentally testing how motivation influences the subjective perception of obstacles.

1.3 Past vs. Future

The timing of obstacles may matter. Thoughts about future events evoke stronger emotions (Caruso, 2010), are seen as more intentional (Burns, Caruso, & Bartels, 2012), prototypical (Kane, VanBoven, & McGraw, 2012), and controllable (Caouette, Wohl, & Peetz, 2012) than thoughts about past events. For example, in a study by Ferrante and colleagues (2013), thoughts about a hypothetical challenge to a goal (failing a task) focused more on controllable aspects of the event (how failure could be avoided through one's own actions) when this challenge was anticipated to occur in the future, but focused more on uncontrollable aspects (how failure could be avoided by external circumstances) when it had already occurred. Similarly, morally unjust events elicit stronger emotions if they have yet to occur than if they already happened – arguably because future events reflect a situation where one's own actions can still influence the outcome (Caruso, 2010; Caouette et al., 2012).

When considering obstacles that might interfere with a person's goals, anticipated obstacles should likewise be perceived as more controllable than recalled obstacles. Past obstacles have little potential to influence future actions, whereas future obstacles may threaten successful goal pursuit. Someone who experiences *want-to* motivation may therefore be particularly likely to guard against or see future obstacles as competing goals, but be less concerned with past obstacles. We sought to investigate, in an exploratory fashion, whether looking at past vs. future obstacles made a difference in the subjective perception of their frequency and disruptiveness.

1.4 Present Studies

In four studies, we investigate the effect of motivation (*want-to* vs. *have-to*) on the subjective perception of frequency and disruptiveness of obstacles, and whether the results differ based on time (perception of past vs. future obstacles). In studies 1 and 2, participants were asked to list all obstacles to the goal of eating healthy that they encountered in the past week (study 1) or anticipated encountering in the coming week (study 2). In studies 3 and 4, participants were asked to rate from a given list all obstacles to the goal of eating healthy encountered in the past week (study 3) or anticipated in the coming week (study 4). In all studies, participants were also asked to rate the obstacles on their disruptiveness. The goal of eating healthy was used because it is endorsed by a large majority of individuals (Milyavskaya & Nadolny, 2016) and people endorse this goal for both *want-to* and *have-to* reasons (Pelletier, Dion, Slovinec-D'Angelo, & Reid, 2004).

First, we had two competing hypotheses regarding the effect of motivation on the subjective perception of obstacles: we hypothesized that, compared to *have-to* motivation, *want-to* motivation would lead to perceiving obstacles as either (a) equally frequent but less disruptive or (b) both less frequent and less disruptive. Although Milyavskaya and colleagues (2015) found that *want-to* motivation was related to experiencing fewer obstacles, they combined the measures of frequency and disruptiveness since the two were highly correlated. By conceptualizing disruptiveness differently as to better differentiate it from frequency, we sought to investigate whether the subjective perception of fewer obstacles can be explained by a perception of obstacles as less disruptive, or as both less frequent and less disruptive.

Second, we were interested in whether the above predictions would hold for both past and future obstacles. On one hand, motivation could be expected to affect perceptions and

subjective recall regardless of the time frame. Alternatively, future obstacles might loom larger than already passed obstacles (Burns et al., 2012; Caruso, 2010; Caouette et al., 2012), such that subjective perceptions of future obstacles matter more than subjective perception of past obstacles and, consequently, vary more depending on the type of motivation.²

2 Method

2.1 Procedure

Four studies were conducted in parallel on different samples, using a similar procedure. In all four studies, participants were asked to complete a writing prime (randomly assigned to priming for *want-to* or *have-to* motivation) for the goal of eating healthy. In studies 1 and 2, they were then asked to list all obstacles to the goal of eating healthy that they encountered in the past week (study 1) or anticipated encountering in the coming week (study 2), along with the frequency of each obstacle and their disruptiveness. Participants in studies 3 and 4 were asked to rate the frequency and disruptiveness of obstacles to the goal of eating healthy encountered in the past week (study 3) or anticipated in the coming week (study 4) from a given list of obstacles.³

2.2 Participants

Participants were recruited from Amazon Mechanical Turk (65.6%⁴) and a Canadian University's student participant pool for these online studies. See Table 1 for a summary of participant information.

² The hypotheses and exploratory questions examined in this study, as well as all analytical decisions (including sample size considerations, criteria for participant exclusion) and planned analyses were pre-registered on OSF at osf.io/kgrwp.

³ Personality questionnaires (Brief Self-Control Scale, Ten-Item Personality Inventory, General Motivation Scale) were included for exploratory purposes, but not examined in the present paper.

⁴ This represents the proportion of participants recruited from MTurk (vs. student participant pool). This proportion remained the same across all four studies.

Table 1

Participant information

	Study 1	Study 2	Study 3	Study 4
Number of recruited participants ⁵	166	165	166	165
Exclusion criteria				
a. Completion time < 5 min.	27	26	21	20
b. Question on importance to eat healthy blank	4	4	2	3
c. Both a & b	18	22	6	9
d. Eating healthy not important	3	1	2	1
e. Question on listing obstacles blank	2	-	-	-
Final number of participants	112	112	135	132
Female	75	65	82	81
Male	36	47	53	51
Other	1	-	-	-
Age				
Average (SD)	31.52 (13.26)	31.64 (13.75)	33.73 (14.83)	35.16 (14.85)
Range	17-64	18-68	17-70	18-72
Median completion time in seconds	467.50	386.00	449.00	420.00

Note. Participants recruited from MTurk and the student participant pool differed significantly on study completion time (in seconds; $M_{\text{MTurk}} = 530.81$, $SD_{\text{MTurk}} = 205.90$; $M_{\text{pp}} = 659.34$, $SD_{\text{pp}} = 485.46$) and age ($M_{\text{MTurk}} = 40.10$, $SD_{\text{MTurk}} = 12.86$; $M_{\text{pp}} = 19.86$, $SD_{\text{pp}} = 2.93$). However, they did not differ on the proportion of males and females (% males_{MTurk} = 37.9, % males_{pp} = 38.5).

⁵ For each study, it was determined that a minimum of 100 participants should be recruited. This number of participants was required to detect a medium size effect with 80% power. This was determined by a power analysis in G*Power for a MANOVA with two groups and two correlated dependent variables. Note: the final analyses turned out to be slightly different based on the nature of the data (see “materials” section), but the calculated and collected sample sizes remain valid.

2.3 Materials⁶

2.3.1 Priming motivation. Participants were provided with examples of why people feel like they *should* eat healthy (e.g., “because they need to lose weight”; “because people around them nag them to do it”) or examples of why people *value* eating healthy (e.g., “because it’s fun to create healthy meals”; “because they want to have more energy”). Participants were then asked to write about why they should eat healthy (*have-to* motivation condition) or value (*want-to* motivation condition) eating healthy.

2.3.2 Frequency of obstacles. In studies 1 and 2, participants were asked to list all situations that get in the way of their pursuit of the goal of eating healthy that they had encountered in the past week (study 1) or anticipated encountering in next week (study 2). Examples listed by participants include “sugar craving”, “running late”, “lack of money”, “lack of time”. For each situation they listed, participants were asked to indicate the number of times they had encountered it or anticipated encountering it. A measure of frequency was computed by summing the given frequencies for each participant. To normalize this variable, a log transformation was performed⁷. A count of listed obstacles was also computed as another measure of frequency. For studies 1 and 2, since the two measures of frequency were not highly correlated enough to be combined (pre-registered cut-off at $r = .75^8$; $r = .68$ for study 1, $r = .65$ for study 2), they were kept as separate variables.

⁶ All study materials can be found on OSF: osf.io/kawmu.

⁷ This was done given that the variable was non-normal (skewness = 4.07 (SE = .16); kurtosis = 23.89 (SE = .33); $W = .65$, $p < .001$). The variable remained non-normal when removing outliers, and doing so did not change the overall pattern of findings. Running non-parametric tests did not change the overall pattern of findings either. When referring to the frequency variable in the remainder of the manuscript, we will be referring to the log-transformed version of this variable.

⁸ Though somewhat arbitrary, this was decided on in the pre-registration phase, as anything greater than .75 would represent too much overlap between the constructs. Pre-registering a firm cut-off was important as to avoid inadvertent p-hacking.

In studies 3 and 4, participants were provided with a list of 18 situations (e.g. “not enough time to cook”; “feeling too tired”; “no healthy food in the house”) that people encounter that sometimes get in the way of their pursuit of goals related to eating healthy. For each listed obstacle, participants were asked how often they had encountered it in the past week (study 3) or anticipated encountering it in the next week (study 4). Frequency was rated on a 5-point scale ranging from “not at all” to “a few times per day”. A measure of frequency was computed by calculating the mean of all frequency scores for each participant. These situations were drawn from a previous study assessing obstacles to eating healthy (Milyavskaya, Inzlicht, Hope, & Koestner, 2015) and from common obstacles to eating healthy reported by a different sample of students.

2.3.3 Disruptiveness of obstacles. For all 4 studies, participants were asked to rate all obstacles on their disruptiveness (i.e. “how strongly did/will it interfere with your goal to eat healthy?”) on a 7-point scale of 1 (*not at all*) to 7 (*a lot*). A measure of disruptiveness was computed by calculating the mean of all disruptiveness scores for each participant.

2.3.4 Combining frequency and disruptiveness. For studies 1 and 2, the first measure of frequency (sum of frequencies) and disruptiveness were weakly correlated ($r = .09$ for study 1, $r = .36$ for study 2). This was also the case for the second measure of frequency (number of listed obstacles) and disruptiveness ($r = .01$ for study 1, $r = .26$ for study 2). Thus, frequency and disruptiveness were kept as separate variables. For studies 3 and 4, since the measures of frequency and disruptiveness were highly correlated ($r = .91$ for study 3, $r = .85$ for study 4), they were combined and their average was used as a measure of obstacles⁹.

⁹ This discrepancy between studies 1 and 2 vs. 3 and 4 for the correlation between frequency and disruptiveness is likely due to the differences in methodologies: in studies 3 and 4, participants were provided with a list of obstacles, and the same list was used to rate both frequency and disruptiveness in the same format (using a 7-point scale), which might have lead participants to perceive the two concepts as similar. However, for studies 1 and 2,

3 Results

3.1 Preliminary analyses

Correlational relationships between main study variables and participant demographic variables (BMI, age) were examined separately for each study. For studies 1 and 2, no significant relationships emerged between main study variables and BMI or age. For studies 3 and 4, there were significant negative relationships between age and the measure of obstacles ($r = -.45$ for study 3, $r = -.38$ for study 4). However, there were no differences in age among conditions in either studies, and entering age as a covariate into the main analyses did not change the results¹⁰. Gender differences were also examined separately for each study. For all studies, there were no significant main effects of gender on key study variables. Finally, we looked at goal importance and across all four studies, goal importance was not significantly different across the two conditions (*want-to* vs. *have-to*) suggesting that the manipulation did not influence goal importance/commitment.

3.2 Effects of Motivation

In studies 1 and 2, we conducted a one-way multivariate analysis of variance (MANOVA) with motivation (*want-to*, *have-to*) as the independent variable, and number of obstacles listed, frequency, and disruptiveness of obstacles as the dependent variables. Study 1 showed no significant multivariate main effect for motivation, Wilks' Lambda = .99, $F(3, 106) = .40$, $p = .75$, $\eta_p^2 = .011$. All means from follow-up ANOVAs are reported in Table 2.

participants were asked to generate their own list of obstacles, and rated frequency and disruptiveness differently (giving a number of times vs. rating on a 7-point scale), which might have lead participants to perceive the two concepts as different.

¹⁰ Follow-up analyses requested by the reviewers showed no moderating effect of age or sample source. As these analyses were not planned they were not considered further.

Table 2

Follow-up ANOVAs: Descriptive Statistics and Effect Sizes

Outcome	Want-to			Have-to			Effect size	
	Mean	SD	N	Mean	SD	N	d	95% CI
Study 1								
Number of obstacles	4.08	2.17	52	3.63	1.79	60	.23	[-.15; .60]
Frequency	1.04	.35	52	1.03	.33	58	.03	[-.35; .40]
Disruptiveness	4.88	1.26	52	4.98	1.19	58	-.08	[-.46; .29]
Study 2								
Number of obstacles	3.59	1.83	54	4.05	2.41	58	-.21	[-.59; .16]
Frequency	.97	.32	54	1.15	.33	56	-.55	[-.94; -.17]
Disruptiveness	4.65	1.24	54	5.21	1.07	57	-.48	[-.86; -.10]
Study 3								
Obstacles	2.54	.96	64	2.49	1.04	71	.05	[-.28; .39]
Study 4								
Obstacles	2.31	.84	66	2.66	.79	66	-.43	[-.77; -.08]

Note. In studies 1 and 3, participants were asked to report on obstacles encountered in the past week, while in studies 2 and 4, they were asked to report on obstacles anticipated in the coming week.

Study 2 showed a significant multivariate main effect for motivation, Wilks' Lambda = .91, $F(3, 106) = 3.70$, $p < .05$, $\eta_p^2 = .095$. Power to detect the effect was .80. Follow-up ANOVAs¹¹ showed significant univariate main effects for frequency, $F(1, 108) = 8.33$, $p < .01$, $\eta_p^2 = .072$, power = .82; and disruptiveness $F(1, 108) = 6.11$, $p < .05$, $\eta_p^2 = .054$, power = .69.

These effects remained significant after correcting for the number of follow-up ANOVAs

¹¹ Prior to conducting these follow-up ANOVAs, the homogeneity of variance assumption was tested for all three dependent variables. Since Levene's tests for number of obstacles listed ($F(1, 108) = 1.98$, $p = .16$), frequency ($F(1, 108) = .04$, $p = .85$), and disruptiveness ($F(1, 108) = .67$, $p = .42$) were all nonsignificant, the homogeneity of variance assumption was satisfied.

performed ($p < .017$). An examination of the descriptive statistics indicated that *want-to* motivation, compared to *have-to* motivation, led to the subjective perception of obstacles as being both less frequent ($M_{\text{want-to}} = .97$, $SD_{\text{want-to}} = .32$; $M_{\text{have-to}} = 1.15$, $SD_{\text{have-to}} = .33$) and less disruptive ($M_{\text{want-to}} = 4.65$, $SD_{\text{want-to}} = 1.24$; $M_{\text{have-to}} = 5.20$, $SD_{\text{have-to}} = 1.07$).

In studies 3 and 4, we conducted a one-way analysis of variance (ANOVA) with motivation (*want-to*, *have-to*) as the independent variable, and obstacles (frequency and disruptiveness combined) as the dependent variable. Study 3 showed no significant main effect of motivation on obstacles $F(1,133) = .10$, $p = .75$, $d = -.05$. Study 4 showed a significant main effect of motivation on obstacles $F(1,130) = 6.07$, $p < .05$, $d = .43$. Power to detect the effect was .69. An examination of the descriptive statistics indicated that *want-to* motivation, compared to *have-to* motivation, led to the subjective perception of fewer obstacles ($M_{\text{want-to}} = 2.31$, $SD_{\text{want-to}} = .84$; $M_{\text{have-to}} = 2.66$, $SD_{\text{have-to}} = .79$).

3.3 Effects of Time

To synthesize our findings and test for potential effects of time in our results, we conducted a meta-analysis of the eight effects across the four studies. We first averaged across each of the three effect sizes in studies 1 and 2 (as to have one effect size for each study; Goh, Hall, & Rosenthal, 2016), and used the two effect sizes from studies 3 and 4 (one each), and included time as a moderator. This was a fixed-effects analysis conducted using Cohen's d as a measure of effect size (see Table 2) and Hedges and colleagues' method for meta-analysis (Hedges & Olkin, 1985; Hedges & Vevea, 1998). Overall, there was a small effect of the manipulation, $d = -.18$, 95% CI $[-.36; -.001]$, $z = -1.97$, $p < .05$, such that participants in the *want-to* condition reported fewer and less disruptive obstacles than in the *have-to* condition¹².

¹² Please note that negative effect size values reported throughout this paragraph indicate that fewer obstacles were reported in the *want-to* (compared to the *have-to*) condition.

Using the between-group homogeneity Q-Statistic, we established the existence of a moderator by confirming that the effect sizes significantly differed between the two time subsets, $Q(1) = 6.90, p < .01$. Next, we divided the data into two subsets (4 results in each) based on moderator characteristics (past, future). There was no effect for the “past” subset, $d = .05, 95\% \text{ CI } [-.19; .30], z = .43, p = .67$. For the “future” subset, there was a moderate effect of the manipulation, $d = -.42, 95\% \text{ CI } [-.68; -.17], z = -3.25, p < .01$. In sum, time moderated the effect of motivation such that for past obstacles, there was no difference between *want-to* and *have-to* motivation, while for future obstacles, there was a significant difference between the two conditions in the frequency and disruptiveness of obstacles experienced.

Table 3

Results of the Meta-analysis

Outcome	d	SE	95% CI	z	p
Study 1	.06	.19	[-.31; .43]	.32	.75
Study 2	-.41	.19	[-.79; -.03]	-2.13	.03
Study 3	.05	.17	[-.28; .38]	.30	.77
Study 4	-.43	.18	[-.77; -.09]	-2.46	.01

4 Discussion

The present research shows that *want-to* motivation, compared to *have-to* motivation, leads to the subjective perception of fewer and less disruptive obstacles, but only when contemplating future obstacles. That is, time moderated the relationship between motivation and the subjective perception of obstacles. For past obstacles, there was no difference between *want-to* and *have-to* motivation in the subjective recall of obstacles, while for future obstacles, *want-to*

motivation (compared to *have-to* motivation) led to the subjective perception of fewer and less disruptive obstacles. As obstacle frequency and disruptiveness were not strongly correlated in studies 1 and 2, we were also able to examine the proposed competing hypotheses, finding that *want-to* motivation led to both less frequent and less disruptive obstacles (rather than seeing equally frequent obstacles as less disruptive).

Although the influence of the temporality of events on the perceptions and emotions they evoke has previously been studied (Burns et al., 2012; Caruso, 2010; Caouette et al., 2012; Kane et al., 2012), as well as the link between motivation and goal progress (see Deci & Ryan, 2008 for a review), this is the first time these two concepts have been studied jointly. Most studies examining the relationship between motivation and goal progress look at past events or track goal progress in real time. Few studies have looked at future events, and no studies so far have looked into the perception of future obstacles (only past obstacles have been investigated; Milyavskaya et al., 2015). Additionally, studies on motivation for goal pursuit typically measure motivation, but rarely manipulate it experimentally.

This research also provides additional support for Milyavskaya and colleagues' (2015) findings that the subjective experience of fewer (and less disruptive) obstacles might be an alternative explanation for the mechanism through which *want-to* motivation leads to more successful goal progress. Because the present studies were experimental rather than correlational, we can draw stronger conclusions about the role of motivation in the subjective perception of obstacles in goal pursuit. Other strengths of this research include the fact that obstacles were assessed using different measures (number, frequency, and disruptiveness), and different methods (listing and rating from a given list). However, because goal progress was not assessed, we cannot conclude that the (reduced) subjective perception of obstacles mediates this

relationship between *want-to* motivation and goal progress. More research is needed to investigate this. Another limitation of these studies is that they did not include a control condition, and thus we cannot experimentally confirm that *want-to*, not *have-to* motivation, is driving the effect. Future studies should include a control condition to confirm whether it is in fact *want-to* motivation that reduces the perceived frequency and disruptiveness of future obstacles, or if alternatively, *have-to* motivation has an increasing effect. Additionally, we only looked at healthy eating goals. Future studies would need to investigate if the same effect of motivation on the subjective perception of obstacles is also observed in other domains. Finally, future research should also examine the question of whether motivation influences the objective number of obstacles encountered, or the subjective perception of those obstacles.

While past research (Milyavskaya et al., 2015) found that *want-to* motivation was related to participants reporting less frequent and disruptive obstacles experienced either in general (study 2) or in the past 6 weeks (study 3), the present study only found effects of motivation on anticipation of future obstacles. This discrepancy in the results between the studies may be explained by the fact that motivation was primed in the current studies, rather than assessed via self-report as in the prior research. When the motivation for a goal is assessed, this measure taps into motivation that influenced past obstacles at the time they occurred, and that will also influence future obstacles. However, when motivation is primed, it does not affect the state participants were in when they experienced past obstacles, but it influences the perception of obstacles that have yet to occur. Since these future obstacles can still influence the outcome of goal pursuit, they are more likely to be malleable. Thus, because in the present studies, motivation was primed, it did not make a difference in the perception of obstacles that occurred

prior to the studies, but it influenced the perception of obstacles anticipated to occur after the studies.

The results of the current research are in line with previous research indicating that *have-to* motivation is linked to more effortful goal pursuit than *want-to* motivation (Milyavskaya et al., 2015). Specifically, effort is likely needed to plan and control for potential obstacles, and especially to overcome these obstacles when they do occur. In contrast, *want-to* motivation is more effortless and automatic (Milyavskaya et al., 2015), and thus individuals anticipate smooth sailing and do not look much into potential obstacles. This raises the question of how *want-to* motivation is adaptive, given that anticipating fewer obstacles might not be beneficial in goal pursuit? Indeed, if *want-to* motivation leads to anticipating fewer obstacles, it might be detrimental when obstacles do occur, in that the latter will be unexpected, and the individual will be less prepared to overcome them (Kappes, Wendt, Reinelt, & Oettingen, 2013). On the other hand, experiencing *have-to* motivation might be more adaptive in that it better prepares for potential difficulties. However, since previous research has found *want-to* motivation to be adaptive and *have-to* motivation less so, it may be that anticipating obstacles does not in itself help to overcome them. The results of this research might also point to a link between *want-to* motivation and optimistic bias (Weinstein, 1980) and future research would need to investigate this further.

In sum, by examining the subjective perception of past and future obstacles in goal pursuit, the present studies showed that time moderates the relationship between *want-to* motivation and the subjective perception of obstacles. Specifically, *want-to* motivation leads to the perception of fewer and less disruptive obstacles, but only when looking at future obstacles. Though the distinction between past and future obstacles was originally exploratory, we made it

an integral part of the manuscript as it led to an unexpected finding - contrarily to what we initially thought, the effects of motivation did not hold across time. However, as with all exploratory findings, it needs to be interpreted with caution and should be replicated.

This research enhances our understanding of the mechanism for the relationship between *want-to* motivation and successful goal progress by experimentally confirming the link between motivation and the subjective perception of obstacles. It also adds to the literature by suggesting that time might be an important factor to consider when investigating the cognitive underpinnings of goal pursuit.

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