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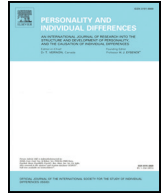


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# The meaning of action: Do self-regulatory processes contribute to a purposeful life?



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## ABSTRACT

Viewing life as purposeful is a powerful belief: in addition to positively coloring our feelings, it is associated with decreased risk of falling ill, and, ultimately, dying (Kim et al., 2013). Having valued goals infuses life with purpose (Scheier et al., 2006), suggesting that purpose is closely tied to people's self-regulation. According to Kruglanski et al. (2000), two self-regulatory processes are important: to attain our goals, we must identify what it is that we want to accomplish and how best to pursue it (assessment), and then follow through and actually do it (locomotion). Does purpose, then, emerge from *moving* toward one's desired outcomes, from carefully *identifying* and *evaluating* the best outcomes to pursue, or both? And could purpose be a mechanism linking people's self-regulatory tendencies to their subjective well-being? Three studies (total  $N = 744$ ) showed that purpose was positively predicted by locomotion, but negatively by assessment; no interaction between locomotion and assessment was found. Moreover, purpose mediated the link between self-regulation and people's satisfaction with life. Our results imply that purpose is derived from movement and that action carries meaning.

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## 1. Introduction

Having a sense that life is purposeful is perhaps one of the most powerful beliefs a person can carry: far from just coloring our thoughts and feelings, viewing life as purposeful is associated with decreased risk of falling ill, and, ultimately, dying (Cohen, Bavishi, & Rozanski, 2015; Hill & Turiano, 2014; Kim, Sun, Park, & Peterson, 2013; Sone et al., 2008). Yet, where do perceptions of purpose come from?

Valued goals are thought to be essential to the experience of purpose in life (Baumeister, 1989; Ryff, Singer, & Love, 2004; Scheier et al., 2006), but it is unclear what exactly it is about the pursuit of such goals that makes them so important. It is possible, for example, that people may come to experience purpose when critically thinking about the relative value of their life's goals and desires while making sure to choose wisely among these. It is also possible that people may come to experience purpose when actually trying to pursue these goals and desires rather than merely reflecting on their importance.

These two possibilities map closely onto the self-regulatory orientations outlined in self-regulatory mode theory (Higgins, 1998; Kruglanski et al., 2000). This theory identifies two independent tendencies that contribute to goal pursuit: To attain our goals, we must identify what it is that we want to accomplish and how best to

get there (assessment), and then follow through and actually do this (locomotion). Assessment, specifically, refers to the critical appraisal of alternative options and reflects an orientation toward carefully considering the value or importance of something. According to theory, it “constitutes the comparative aspect of self-regulation concerned with critically evaluating entities or states, such as goals or means in relation to alternatives in order to judge relative quality” (Kruglanski et al., 2000, p. 794). Locomotion, on the other hand, refers to the psychological experience of movement and reflects an orientation toward making quick and continuous goal progress. It “is the self-regulatory aspect concerned with movement from state to state and with committing the psychological resources that will initiate and maintain goal-directed progress in a straightforward manner, without undue distractions or delays” (Kruglanski et al., 2000, p. 794). Together, these two orientations make up necessary components of all self-regulation.

Does a purposeful life, then, emerge from *moving* toward one's desired outcomes or from carefully *evaluating* and *identifying* the best outcomes to pursue? Our research attempted to answer this previously unexplored question by investigating people's self-regulatory tendencies toward assessment versus locomotion as potential sources of purpose in life.

### 1.1. Modes of self-regulation: Assessment and locomotion

When it comes to successful self-regulation, people must go through a number of steps to achieve their valued goals, referred to as

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assessment and locomotion (Avnet & Higgins, 2003; Kruglanski et al., 2000). According to classic theories (Carver & Scheier, 1990; Gollwitzer, 1990; Higgins, 1998), self-regulation involves carefully comparing and selecting among different end-states to identify those to pursue and deciding how to best attain those desired states (assessment). It is also necessary to initiate the goal-directed action necessary to actually achieve those states (locomotion). While both of these self-regulatory modes are needed for successful achievement of one's goals, assessment and locomotion are independent tendencies that can be emphasized to different degrees by different people and in different situations (Kruglanski, Orehek, Higgins, Pierro, & Shalev, 2010; Orehek, Mauro, Kruglanski, & van der Bles, 2012). From this perspective, one can be high on one tendency and low on the other, high on both, or low on both.

People's relative emphasis on each of these self-regulatory orientations has consequences for the direct targets of their attempts to self-regulate, including how quickly they complete their tasks (e.g., Pierro, Giacomantonio, Pica, Kruglanski, & Higgins, 2011). Moreover, people's relative emphasis on locomotion or assessment is associated with different facets of their subjective well-being (Hong, Tan, & Chang, 2004; Kruglanski et al., 2000). Kruglanski and colleagues, for example, found that locomotion was associated with less depression, while assessment with more depression. Given that self-regulation seems essential in shaping beliefs about life's purposefulness (e.g., Scheier et al., 2006), locomotion and assessment are particularly likely to influence the extent to which life is experienced as purposeful. In the following section, we will discuss our predictions about how people's locomotion and assessment tendencies may influence their perceived purpose in life, starting with the expected relationship between locomotion and purpose in life.

#### 1.1.1. Purpose in life and locomotion

First, we predicted that a high focus on locomotion would be positively associated with purpose in life. As mentioned earlier, purpose is thought to emerge from moving toward one's valued goals and objectives (Carver & Scheier, 1998; Ryff et al., 2004; Scheier et al., 2006), and locomotion tendencies signal the desire to engage in precisely this form of action. As Scheier et al. (2006, p. 291) suggested, people must actually *put effort* toward their personal desires for a sense of purpose to emerge: "Valued goals are important because they provide a purpose for living. Valued goals also provide the mechanism by which a person remains behaviorally engaged in life." Consistent with this notion, Kruglanski et al. (2000) found that locomotion was related to important subjective well-being variables in the same way that purpose in life is. They found, for example, that just like purpose in life (e.g., Scheier et al., 2006), locomotion was associated with greater self-esteem and optimism as well as less depression. It is possible that higher perceptions of purpose in life are one pathway through which locomotion may confer these states of well-being.

In further support of our prediction that locomotion will be positively associated with purpose in life, ample research has shown that movement toward one's goals is associated with subjective well-being in a general sense. In the work place, for example, locomotion has been associated with less stress, burnout, and psychological strain (Bélanger et al., 2015; De Carlo et al., 2014). Movement toward one's goals, moreover, has been associated with greater life satisfaction (Brandstadter & Renner, 1990; Harlow & Cantor, 1996; Palys & Little, 1983; Ruehlman & Wolchik, 1988) and happiness (Smith, Haynes, Lazarus, & Pope, 1993), as well as less negative feelings, depression, and neuroticism (Brandstadter & Renner, 1990; Emmons & King, 1988; Ruehlman & Wolchik, 1988). Worth (1995) found that incarcerated people were less likely to seek medical help for mental and physical illness and were less likely to resort to violence when their prison allowed them to pursue long-term educational goals. Similarly, Wrosch, Scheier, Miller, Schulz, and Carver (2003) found that college students' ability to pursue new goals when entering college was positively associated with the extent to which they perceived their lives as purposeful.

#### 1.1.2. Purpose in life and assessment

We also expected that strong assessment tendencies would be associated with lower perceptions of purpose in life. While a certain degree of assessment may be necessary to select the most functional (in this case most valuable or purposeful) goals to pursue, critically reflecting on one's life goals and desires does not mean that one will actually try to fulfill these. Assessment may also be associated with lower purpose in life because of its focus on critical evaluation. A high tendency toward assessment is likely to disrupt a person's goal engagement efforts, leading them to suspend goal pursuit in order to re-evaluate their chosen means to attain the goal and sometimes even the goal itself (Kruglanski et al., 2000).

Such focus on evaluation is likely to deter high assessors from pursuing some goals and courses of action, instead freezing them in a state of non-action. Indeed, high assessors are more likely to procrastinate than low assessors (Pierro et al., 2011). Whereas purpose is thought to emerge from acting toward a valuable goal, high assessors are prone to second-guess their chosen course of action, thereby undermining their engagement in focused pursuit of their goals and desires. Such indecision should interfere with dedicated action, likely decreasing the extent to which assessors' behaviors feel purposeful.

A high tendency toward assessment may further detract from the sense that life is purposeful because, concerned as high assessors are with evaluation, they care more about the *consequences* of their activities rather than engaging in the activity *itself*, including how their actions and their outcomes reflect on them as a person and how their choices are perceived by others (Bélanger et al., 2015; Kruglanski et al., 2000; Pierro, Kruglanski, & Higgins, 2006). Purpose is unlikely to result from doing things to please others, but rather results from doing things for their own sake (Bronk, Hill, Lapsley, Talib, & Finch, 2009; Kashdan & McKnight, 2009; McKnight & Kashdan, 2009), further suggesting that assessment will decrease perceptions of purpose in life.

#### 1.1.3. Purpose in life and a combination of assessment and locomotion

Of course, the final possibility exists that locomotion and assessment give rise to purpose in life together. Previous research on locomotion and assessment, for example, has found that a combination of high locomotion and high assessment predicts greater success in one's pursuits, including higher grade point averages for students and higher likelihood of successfully completing an elite military course for men in military service (Kruglanski et al., 2000). On the other hand, Hong and colleagues (Hong et al., 2004) found that a combination of high locomotion and low assessment predicted greater well-being, in this case, greater life satisfaction and lower depression. Because of this, we will also test for the possibility that locomotion and assessment may interact to predict perceptions of purpose in life.

### 1.2. The present research

We conducted three studies to investigate the links between purpose in life and the self-regulatory tendencies toward locomotion and assessment. In Study 1, we measured people's self-regulatory mode tendencies and perceptions of purpose in life. In Study 2, we measured these variables in a different sample, and included a measure of life satisfaction in order to test the possibility that purpose might mediate the link between regulatory modes and subjective well-being. In Study 3, we tested whether we could replicate the findings of Study 2 in a different sample and using a different measure of purpose in life than in the preceding studies. For all studies, we report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Our sample sizes (443 in Study 1, 188 in Study 2, and 113 in Study 3) were determined by a combination of power analyses and decision rules implemented at the time of data collection. For our power analyses, we focused on our two main effects of interest, namely the potential associations between locomotion and purpose in life and between

assessment and purpose in life. Although no previous research has investigated these links, findings from Kruglanski et al. (2000) suggest that the associations between locomotion and several variables known to be associated with purpose in life (specifically, optimism, vitality, and self-esteem; e.g., Scheier et al., 2006) are moderate to large in magnitude, whereas the associations between assessment and these variables are small to moderate. Power analyses using G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007) showed that we would need data from 32 to 266 participants to detect effects ranging between these magnitudes, assuming a power of 0.80.

In Study 1, we collected data through Amazon's Mechanical Turk and were able to substantially exceed the recommended sample size due to the relatively low cost of conducting research through this platform. In Study 2, we collected data from undergraduate students in the laboratory. We were able to approach the upper limit of the recommended sample size, but we were limited by the number of participants that we could reasonably schedule for a laboratory visit over the course of the data collection period (which comprised 4 months). Finally, in Study 3, we recruited participants through the online forum Reddit. These participants volunteered to complete our study and we instituted an a priori stop rule, such that we terminated data collection once no new participants completed the survey for several consecutive days.

## 2. Study 1

Our first study assessed the correlations between locomotion, assessment, and purpose in life, with participants completing self-report measures of each of these variables.

### 2.1. Participants and experimental design

We sampled 443 participants (284 males, 157 females, and 2 people who did not identify as either male or female, but chose the option "other") from the United States through Amazon's Mechanical Turk (MTurk) in exchange for \$0.40. Participants came from 45 states and were between 18 and 73 years of age ( $M = 29.22$ ,  $SD = 9.56$ ). As part of a larger study, participants completed measures of their regulatory mode tendencies and purpose in life in randomized order.<sup>1</sup>

### 2.2. Materials and procedure

#### 2.2.1. Locomotion and assessment

Participants filled out the Regulatory Mode Questionnaire (RMQ; Kruglanski et al., 2000), which measures people's tendency toward locomotion and assessment with 12 items each. An example item of the locomotion subscale is "I am a doer" and an example item of the assessment subscale is "I am a critical person". Participants reported their agreement with each of the items on a 6-point Likert scale ranging from 1 (Strongly disagree) to 6 (Strongly agree). After reverse coding the negatively worded items, composite scores were calculated for locomotion (Cronbach's  $\alpha = 0.86$ ,  $M = 4.07$ ,  $SD = 0.75$ ) and assessment (Cronbach's  $\alpha = 0.83$ ,  $M = 3.89$ ,  $SD = 0.75$ ).

#### 2.2.2. Purpose in life

To measure perceptions of purpose in life, we used the presence of meaning subscale from the Meaning in Life Questionnaire (MLQ; Steger, Frazier, Oishi, & Kaler, 2006). Because this questionnaire was designed to measure perceptions of meaning in life (which include, but are not thought to be identical to, perceptions of purpose in life; e.g., Waytz, Hershfield, & Tamir, 2015), we only included the three (out of five) items from this subscale that specifically referred to purpose in life. These items were: "My life has a clear sense of purpose," "I have discovered a satisfying life purpose," and "My life has no clear purpose"

(reverse coded). Participants reported their agreement with each of these items on a scale ranging from 1 (Absolutely Disagree) to 7 (Absolutely Agree). After reverse scoring the last item, we created a composite score of purpose in life by averaging across the items (Cronbach's  $\alpha = 0.87$ ,  $M = 4.38$ ,  $SD = 1.57$ ).

## 2.3. Results and discussion

In order to investigate the associations between locomotion, assessment, and purpose in life, we performed a hierarchical linear regression with purpose in life as the outcome variable and locomotion (Step 1), assessment (Step 2), and their interaction (Step 3) as predictor variables. All predictor variables were centered and bivariate correlations among these variables are displayed in Table 1.

As can be seen in Table 2, locomotion was associated with greater purpose in life (Step 1), while assessment was associated with lower purpose in life (Step 2). Although adding assessment to the model improved model fit, adding the interaction between locomotion and assessment did not. This interaction, moreover, did not significantly predict purpose in life and locomotion and assessment remained significant predictors of purpose in life (Step 3).

Based on these results, it seems that people may be more likely to perceive their lives as purposeful when they actively pursue their valued goals (locomotion). Instead, they may be less likely to perceive their lives as purposeful when they are concerned with finding the best goals to pursue and the right way of doing so (assessment).

## 3. Study 2

In Study 2, we aimed (a) to replicate the findings from Study 1 using a college student sample and (b) to test whether our findings extend to other markers of well-being by considering purpose in life as a mediator between regulatory mode and such markers. Purpose in life has been linked to several well-being markers, including greater life satisfaction (Heisel & Flett, 2004), as have locomotion and assessment tendencies. Hong and colleagues (Hong et al., 2004), for example, found that locomotion was associated with greater life satisfaction, but only when people's assessment was low. Recently, Mens and Scheier (2015) found in a prospective study that the ability to re-engage in new goals at baseline predicted greater well-being 8 months later through increasing purpose in life over time. Because of the prospective nature of this study, it is possible that locomotion might be able to inform people's life satisfaction judgments through increasing perceived purpose in life. The measure used by Mens, Helgeson, Lembersky, Baum, and Scheier (2015), however, combined assessment and locomotion into one metric, and thus did not allow for examination of each component separately.

We therefore tested the associations between locomotion, assessment, purpose in life, and life satisfaction. We predicted that purpose in life would mediate the links between locomotion and life satisfaction and between assessment and life satisfaction such that (a) locomotion would be associated with greater purpose in life and (b) assessment with lower purpose in life. We also predicted that (c) greater purpose in life would, in turn, be associated with greater life satisfaction.

**Table 1**  
Bivariate correlations among purpose in life and regulatory modes.

	1	2	3
1. Locomotion	–		
2. Assessment	–0.01	–	
3. Purpose	0.50***	–0.24***	–

\*\*\*  $p < 0.001$ .

<sup>1</sup> Other measures included participants' construal level, their need for cognition, and their search for meaning in life.

**Table 2**

Hierarchical linear regression with purpose in life as the outcome variable. All independent variables are centered.

Variable	B	SE	t	p	95% CI B	R <sup>2</sup> change	F change
Step 1							
Locomotion	0.79	0.07	12.13	<0.001	[0.66; 0.91]	0.25	147.08***
Step 2							
Locomotion	0.78	0.06	12.53	<0.001	[0.66; 0.91]	0.05	33.91***
Assessment	−0.36	0.06	−5.82	<0.001	[−0.49; −0.24]		
Step 3							
Locomotion	0.79	0.06	12.62	<0.001	[0.67; 0.91]	0.003	2.15
Assessment	−0.38	0.06	−5.98	<0.001	[−0.50; −0.25]		
Locomotion* Assessment	0.08	0.06	1.47	0.14	[−0.03; 0.19]		

\*\*\*  $p < 0.001$ .

### 3.1. Participants and experimental design

One hundred eighty-eight college students (81 males; 106 females; 1 person who did not identify as either male or female and chose the option “other”) from a large American university participated in a laboratory study in exchange for course credit. Participants were between 18 and 23 years of age, with an average age of 18.60 years ( $SD = 0.96$ ). As part of a larger study, participants first completed a measure of regulatory mode, followed by measures of purpose in life and life satisfaction.<sup>2</sup>

### 3.2. Materials and procedure

#### 3.2.1. Locomotion and assessment

Participants completed the same regulatory mode measure as in Study 1 (RMQ; Kruglanski et al., 2000). Internal reliability for the locomotion subscale was 0.82 ( $M = 4.33$ ,  $SD = 0.69$ ), and for the assessment subscale, 0.81 ( $M = 4.06$ ,  $SD = 0.76$ ).

#### 3.2.2. Purpose in life

Participants answered the same three items from the presence of meaning in life subscale from the MLQ (Steger et al., 2006) as in Study 1 to measure their perceptions of purpose in life (Cronbach's  $\alpha = 0.88$ ,  $M = 4.60$ ,  $SD = 1.47$ ).

#### 3.2.3. Life satisfaction

Participants completed the Satisfaction with Life Scale (Diener, Emmons, Larsen, & Griffin, 1985), a reliable and valid 5-item measure of people's life satisfaction judgments (Pavot & Diener, 1993). Items (e.g., I am satisfied with life) were answered on a 7-point Likert-scale, ranging from 1 (Strongly disagree) to 7 (Strongly agree). Internal reliability was 0.87 ( $M = 4.84$ ,  $SD = 1.31$ ).

### 3.3. Results and discussion

We tested the prediction that perceptions of purpose in life would mediate the links between locomotion and life satisfaction and between assessment and life satisfaction by conducting a mediation analysis whereby locomotion and assessment predicted life satisfaction through purpose in life (using PROCESS, Model 4; Hayes, 2013). Confidence intervals reflect unstandardized estimates of the indirect effects (i.e., of locomotion to life satisfaction and of assessment to life satisfaction) and were calculated based on 5000 bias-corrected bootstrap samples (see Fig. 1). Bivariate correlations among our variables are displayed in Table 3.

As can be seen in Fig. 1, locomotion was positively associated with purpose ( $a_1 = 0.93$ ,  $t(185) = 6.69$ ,  $p < 0.001$ , 95% CI [0.66; 1.21]),

<sup>2</sup> Other measures included participants' attachment style, the Big Five, an error detection task, a timed typing task, participants' search for meaning in life, and a measure of significance in life that the first two authors were pretesting.

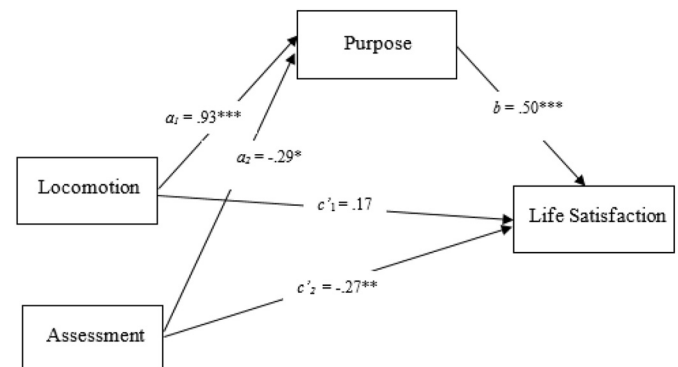
while assessment was negatively associated with purpose ( $a_2 = -0.29$ ,  $t(185) = -2.30$ ,  $p = 0.03$ , 95% CI [−0.54; −0.05]). Perceptions of purpose in turn, were associated with greater life satisfaction after controlling for locomotion and assessment ( $b = 0.50$ ,  $t(184) = 8.74$ ,  $p < 0.001$ , 95% CI [0.39; 0.61]). Analyses, moreover, revealed a significant indirect effect of locomotion on life satisfaction via purpose in life (95% CI [0.31; 0.65]) and of assessment on life satisfaction via purpose in life (95% CI [−0.30; −0.01]). There was no evidence that locomotion was associated with life satisfaction independent of its association with purpose in life ( $c'_1 = 0.17$ ,  $t(184) = 1.44$ ,  $p = 0.15$ , 95% CI [−0.06; 0.41]). Assessment, however, was associated with life satisfaction after taking into account purpose in life ( $c'_2 = -0.27$ ,  $t(184) = -2.75$ ,  $p = 0.01$ , 95% CI [−0.47; −0.08]).

We finally tested for a potential interaction between locomotion and assessment in predicting purpose in life and life satisfaction. After controlling for the main effects of locomotion and assessment, the interaction between them was not significantly associated with participants' self-reported purpose in life ( $b = -0.01$ ,  $t(184) = -0.12$ ,  $p = 0.90$ , 95% CI [−0.18; 0.16]), nor with their life satisfaction ( $b = 0.05$ ,  $t(184) = 0.66$ ,  $p = 0.51$ , 95% CI [−0.10; 0.21]).

Study 2 therefore replicated the results of Study 1, showing that locomotion was associated with greater purpose in life and that assessment was associated with lower purpose in life. It also showed that locomotion and assessment were indirectly associated with life satisfaction through purpose in life.

## 4. Study 3

One limitation of our previous studies is that they did not use a measure that was specifically designed to measure purpose in life. We therefore tested the generalizability of our findings by assessing purpose in life with a widely used and well-validated measure. As in Studies 1 and 2, we measured locomotion and assessment, purpose in life, and life satisfaction. We predicted that purpose would mediate the links



**Fig. 1.** Mediation model from locomotion and assessment to life satisfaction as mediated by purpose in life (Study 2). \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

**Table 3**  
Bivariate correlations among purpose in life, life satisfaction, and regulatory modes.

	1	2	3	4
1. Locomotion	–			
2. Assessment	0.02	–		
3. Purpose	0.43***	–0.13*	–	
4. Life satisfaction	0.33***	–0.23**	0.62***	–

\*  $p < 0.10$ ;  
\*\*  $p < 0.01$ ;  
\*\*\*  $p < 0.001$ .

between locomotion and life satisfaction and between assessment and life satisfaction such that locomotion would be associated with greater purpose, assessment with lower purpose, and that purpose, in turn, would be associated with greater life satisfaction.

4.1. Participants and experimental design

We recruited 113 participants through the online web forum Reddit (/r/SampleSize), who volunteered to participate in our study without return of payment. Participants (59 males, 53 females, and 1 different gender identification) were between 18 and 68 years old ( $M = 26.18$ ,  $SD = 7.87$ ) and were mostly from the United States ( $n = 72$ ; 63.7%). Other participants were from Canada ( $n = 14$ ; 12.4%), Western-Europe ( $n = 9$ ; 13.3%), Australia ( $n = 4$ ; 3.5%), Asia ( $n = 3$ ; 2.7%), South America ( $n = 2$ ; 1.8%), and Eastern Europe ( $n = 2$ ; 2.7%). While our sample size in this study is smaller due to fewer participants volunteering to participate without payment, this recruitment method allowed us to test the generalizability of our findings using measures that were different from our previous studies.

4.2. Materials and procedure

Participants completed measures of their locomotion tendencies, assessment tendencies, purpose in life, and life satisfaction in the order listed.

4.2.1. Locomotion and assessment

Participants completed the RMQ (Kruglanski et al., 2000). Internal reliability for the locomotion subscale was 0.91 ( $M = 3.87$ ,  $SD = 0.99$ ), and for the assessment subscale, 0.87 ( $M = 4.21$ ,  $SD = 0.92$ ).

4.2.2. Purpose in life

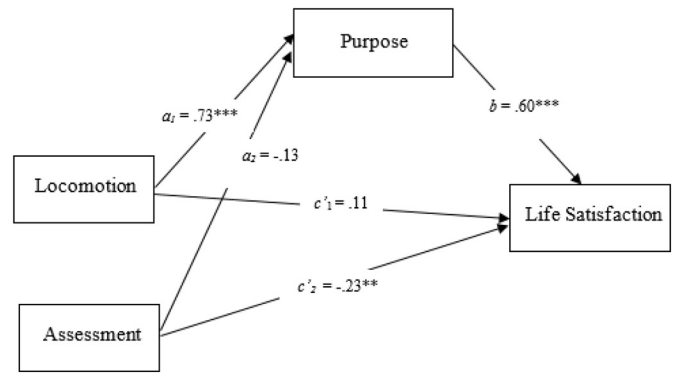
As a measure of perceived purpose in life, participants completed the Life Engagement Test (LET, Scheier et al., 2006). Participants were asked to rate their agreement with 6 items such as “To me, all the things I do are worthwhile” and “I have lots of reasons for living” on a 5-point Likert scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). Internal reliability was 0.93 ( $M = 3.42$ ,  $SD = 1.12$ ).

4.2.3. Life satisfaction

Participants also completed the Satisfaction with Life Scale (Diener et al., 1985) on a 7-point Likert-scale, ranging from 1 (Strongly disagree) to 5 (Strongly agree). Internal reliability was 0.91 ( $M = 3.08$ ,  $SD = 1.12$ ).

4.3. Results and discussion

As in Study 2, we used PROCESS (Model 4; Hayes, 2013) to test the prediction that perceptions of purpose in life would mediate the links between locomotion and life satisfaction and between assessment and life satisfaction through purpose in life. Confidence intervals reported below reflect unstandardized estimates of the indirect effects and were calculated based on 5000 bias-corrected bootstrap samples (see Fig. 2). Bivariate correlations among our variables can be found in Table 4.



**Fig. 2.** Mediation model from locomotion and assessment to life satisfaction as mediated by purpose in life (Study 3). \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$ .

As can be seen in Fig. 2, locomotion was positively associated with purpose ( $a_1 = 0.73$ ,  $t(110) = 9.02$ ,  $p < 0.001$ , 95% CI [0.57; 0.90]), while assessment was not associated with purpose ( $a_2 = -0.13$ ,  $t(110) = -1.47$ ,  $p = 0.14$ , 95% CI [-0.30; 0.05]). Perceptions of purpose in turn, were associated with greater life satisfaction ( $b = 0.59$ ,  $t(109) = 6.70$ ,  $p < 0.001$ , 95% CI [0.42; 0.77]). Analyses, moreover, revealed a significant indirect effect of locomotion on life satisfaction via purpose in life (95% CI [0.30; 0.61]), but not of assessment on life satisfaction via purpose in life (95% CI [-0.17; 0.001]). There was no evidence that locomotion was associated with life satisfaction independent of its association with purpose in life ( $c'_1 = 0.11$ ,  $t(109) = 1.15$ ,  $p = 0.25$ , 95% CI [-0.08; 0.31]). Assessment, however, was associated with life satisfaction after taking into account purpose in life ( $c'_2 = -0.23$ ,  $t(109) = -2.85$ ,  $p = 0.01$ , 95% CI [-0.40; -0.07]).

We also tested for a potential interaction between locomotion and assessment in predicting purpose in life and life satisfaction. After controlling for locomotion and assessment, the interaction between them was not significantly associated with purpose in life ( $b = 0.01$ ,  $t(109) = 0.17$ ,  $p = 0.86$ , 95% CI [-0.13; 0.16]), nor with life satisfaction ( $b = 0.04$ ,  $t(109) = 0.53$ ,  $p = 0.60$ , 95% CI [-0.12; 0.20]).

Study 3 was generally consistent with our previous results, showing that locomotion was associated with greater life satisfaction through greater perceived purpose in life. Unlike our previous studies, however, we did not find a significant association between assessment and life satisfaction through perceived purpose in life. It is possible, perhaps, that the smaller sample size in this study contributed to the absence of a significant association.

5. Within-paper analysis

Although the results across our three studies were generally consistent, they were not identical from one study to the next. Moreover, we conducted our studies in different settings with different samples and different measures. Because of these and other potential sources of variability, we performed a within-paper analysis (aggregating across relevant studies) to estimate the average effect sizes of our most important effects: the links between the two regulatory modes and purpose in life (Studies 1, 2, & 3) and the indirect effects from these regulatory modes to life satisfaction via purpose in life (for Studies 2 & 3). This analysis

**Table 4**  
Bivariate correlations among purpose in life, life satisfaction, and regulatory modes (Study 3).

	1	2	3	4
1. Locomotion	–			
2. Assessment	–0.30**	–		
3. Purpose	0.68***	–0.30**	–	
4. Life satisfaction	0.56***	–0.40***	0.72***	–

\*\*  $p < 0.01$ ;  
\*\*\*  $p < 0.001$ .

seems appropriate given that the three studies reported here are the only correlational studies that we conducted in which we measured these variables together and given that we are not aware of any related research testing the associations between self-regulatory mode and purpose in life.

The within-paper analysis proceeded as follows. First, we computed Z-scores of our independent and dependent variables; we used Z-scores because the dependent variable was not always measured using the same questionnaire (without this transformation, Likert scale and participants' responses across the studies would not have been comparable). Participant's Z-scores were then merged into a single dataset, after which we performed regression analyses while controlling for the study participants were in (i.e., we created two dummy-coded variables to indicate which of our studies participants' data came from, using Study 1 as the reference group).

5.1. Purpose in life

The results of our analyses are presented in Table 5. Across the three studies, for every standard deviation of increase in locomotion, purpose in life increased by 0.50 standard deviations. For every standard deviation of increase in assessment, self-reported purpose in life decreased by 0.20 standard deviations. We also tested the interaction among locomotion and assessment in predicting purpose in life. This interaction term was not significant.

5.2. Life satisfaction through purpose in life

We then used PROCESS (Model 4; Hayes, 2013) to test whether changes in purpose in life mediated the link between participants' locomotion and/or assessment tendencies and their life satisfaction in Studies 2 and 3 (because life satisfaction was not measured in Study 1). All of our variables were standardized and we added the study that participants were in as a dummy coded covariate. Confidence intervals reflect unstandardized estimates of the indirect effects (i.e., of locomotion to life satisfaction and of assessment to life satisfaction) and were calculated based on 5000 bias-corrected bootstrap samples (see Fig. 3).

As can be seen in Fig. 3, locomotion was associated with greater purpose in life ( $a_1 = 0.51, t(297) = 10.51, p < 0.001, 95\% CI [0.42; 0.61]$ ), while assessment was associated with lower purpose in life ( $a_2 = -0.15, t(297) = -3.09, p = 0.002, 95\% CI [-0.25; -0.05]$ ). Purpose in life was, in turn, associated with greater life

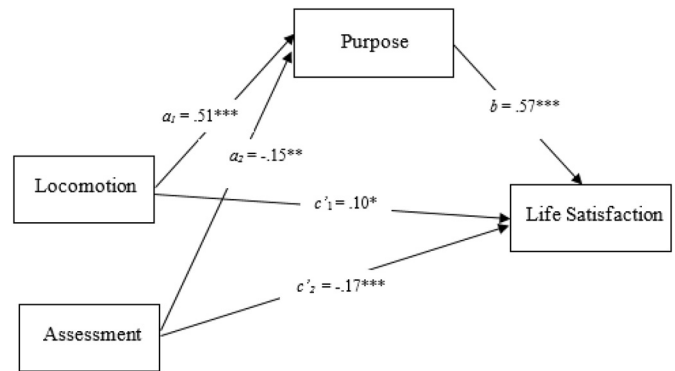


Fig. 3. Mediation model from locomotion and assessment to life satisfaction as mediated by purpose in life (within-paper analysis). \* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

satisfaction ( $b = 0.57, t(296) = 11.18, p < 0.001, 95\% CI [0.47; 0.67]$ ). Analyses, moreover, showed a significant indirect effect of locomotion on life satisfaction via purpose in life ( $95\% CI [0.22; 0.37]$ ) and of assessment on life satisfaction via purpose in life ( $95\% CI [-0.15; -0.03]$ ). Locomotion was associated with life satisfaction after taking into account purpose in life ( $c'_1 = 0.10, t(296) = 2.00, p = 0.046, 95\% CI [0.002; 0.20]$ ), as was assessment ( $c'_2 = -0.17, t(296) = -3.98, p < 0.001, 95\% CI [-0.26; -0.09]$ ).

6. General discussion

Having valuable goals to pursue imbues life with purpose (Carver & Scheier, 1998; Ryff et al., 2004; Scheier et al., 2006), suggesting that self-regulation is important for shaping the extent to which life is experienced as purposeful. Do perceptions of purpose, then, arise from concern with moving toward one's goals (locomotion) or from concern with carefully evaluating the best goals to pursue (assessment)? Three studies found that an emphasis on locomotion was associated with greater perceptions of life as purposeful, while an emphasis on assessment was associated with lower perceptions of life as purposeful. We found no compelling evidence that locomotion and assessment interacted in predicting purpose in life. Moreover, two of our studies (Studies 2 & 3) found that such changes in purpose mediated the links between locomotion and greater life satisfaction and between assessment and lower life satisfaction. Our studies revealed a fairly consistent

Table 5 Hierarchical linear regression with standardized purpose in life scores as the outcome variable. Study was dummy coded into two variables (Study 1 vs. Study 2; Study 1 vs. Study 3) and all continuous independent variables were standardized.

Variable	B	SE	t	p	95% CI B	R <sup>2</sup> change	F change
Step 1						0.00	<0.001
Study 1 vs. Study 2	0.00	0.09	0.00	1.00	[-0.17; 0.17]		
Study 1 vs. Study 3	0.00	0.11	0.00	1.00	[-0.21; 0.21]		
Step 2						0.26	261.70***
Study 1 vs. Study 2	-0.03	0.08	-0.04	0.97	[-0.15; 0.14]		
Study 1 vs. Study 3	0.00	0.09	0.00	1.00	[-0.18; 0.18]		
Locomotion	0.51	0.03	16.18	<0.001	[0.45; 0.57]		
Step 3						0.04	41.91***
Study 1 vs. Study 2	-0.003	0.07	-0.04	0.97	[-0.15; 0.14]		
Study 1 vs. Study 3	0.00	0.09	0.00	1.00	[-0.17; 0.17]		
Locomotion	0.50	0.03	16.32	<0.001	[0.44; 0.56]		
Assessment	-0.20	0.03	-6.47	<0.001	[-0.26; -0.14]		
Step 4						0.001	1.38
Study 1 vs. Study 2	-0.004	0.07	-0.06	0.95	[-0.15; 0.14]		
Study 1 vs. Study 3	0.009	0.09	0.11	0.92	[-0.17; 0.18]		
Locomotion	0.51	0.03	16.37	<0.001	[0.45; 0.57]		
Assessment	-0.20	0.03	-6.58	<0.001	[-0.27; -0.14]		
Locomotion* Assessment	0.03	0.03	1.18	0.24	[-0.02; 0.09]		

\*\*\*  $p < 0.001$ .

pattern of results across somewhat different samples (i.e., participants from Amazon's Mechanical Turk, undergraduate students, and participants from Reddit), with a within-paper analysis supporting the reliability of these effects and providing some suggestion about the likely magnitude of the effect sizes.

Researchers have long pointed to the importance of self-regulation for a successful life (e.g., Baumeister, Heatherton, & Tice, 1994). Indeed, the ability to self-regulate by moving toward desired outcomes is crucial for satisfying some of our most basic needs, including for finding food and shelter and for building meaningful relationships with other people (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Baumeister & Exline, 2000; Carver & Scheier, 1998; Mischel, Cantor, & Feldman, 1996). Our results show that engaging in action toward one's goals may also serve to infuse life with purpose, a motive that many have argued is another basic need (Becker, 1962, 1975; Greenberg, Koole, & Pyszczynski, 2004; Kruglanski, Chen, Dechesne, Fishman, & Orehek, 2009; Maslow, 1943, 1967; Seligman, 2002) and even "the primary motivational force in man" (Frankl, 1963; p.121).

For a while, researchers have targeted people's perceptions of purpose as an important modifiable risk factor for improving their physical health and mental well-being (see Frankl, 1963). In line with our findings, researchers have tried to increase elderly people's perceptions of purpose by providing them with meaningful goals, including opportunities to do volunteer work. Giving these people something to strive for not only improved their subjective well-being and quality of life, but also increased the length of time they lived following the intervention (George & Whitehouse, 2010; Harris & Thoresen, 2005; Okun, Yeung, & Brown, 2013). Complementing these earlier findings, our research showed the contribution of being oriented toward goal-directed action for a greater sense of purpose.

Although past research has also looked at associations between self-regulatory modes and well-being, we believe that our work differs from this earlier work in a number of ways. For one, no research has—as far as we are aware—provided a mechanism that might link self-regulatory mode with life satisfaction. We believe that studying this link is valuable both because of the theoretical pathway it provides from self-regulatory tendencies to subjective well-being, but also because of the important outcomes associated with viewing life as purposeful per se (e.g., longevity; Cohen et al., 2015).

Moreover, our research extends and amplifies on findings previously reported by others. Specifically, Hong et al. (2004) investigated the link between self-regulatory mode and life satisfaction. These authors found that locomotion and assessment interacted in predicting people's satisfaction with life, with a combination of high locomotion and low assessment predicting greater life satisfaction. Unlike Hong and colleagues, we found no evidence for such an interaction effect (see Studies 2 & 3;  $N = 301$ ).

Clearly, this interactive effect has some limitations on its occurrence. Although it is hard to say why we did not replicate this earlier finding, it is possible that cultural differences may have been partially responsible for this. While we primarily sampled Americans, Hong and colleagues exclusively sampled Asian participants. As Steger, Kawabata, Shimai, and Otake (2008) found, the associations between purpose in life and other variables related to well-being differ for American versus Asian participants. For example, while perceived purpose in life was associated with lower search for life's meaning among American participants, perceived purpose in life was associated with *higher* search for life's meaning among Asian participants.

We should note that, for some readers, the negative association between assessment and purpose in life might come as a surprise. After all, the ability to identify worthy goals to pursue may generate more feelings of purpose than deciding to pursue just about any goal. We believe that the negative association that we found between assessment and purpose in life might at least partially stem from the specific scale that we used to measure people's assessment tendencies. In this regard, it is interesting that all studies of which we are aware, and that found

negative associations between assessment and well-being, were conducted using the same measure of assessment (e.g., Hong et al., 2004).

Inspection of the items on the assessment scale, suggests that it might be assessing more than just the tendency to compare and identify goals. For example, it also seems to reflect a tendency to be hypercritical and to be prone to rumination, as may be seen in items such as "I often compare myself with other people" and "I am very self-critical and self-conscious about what I am saying".

Future research should be sensitive to the multi-faceted nature of the assessment scale as questions regarding associations between assessment and well-being are pursued. It might be profitable to decompose assessment into its core components, and then separately evaluate associations between each of those components and well-being. Perhaps some components (e.g., goal identification and commitment) are positively related to well-being, whereas others (e.g., hyper-criticality and rumination) have more negative associations.

Like most research studies, our work was limited by several factors. First, questions may arise about how distinct the constructs of purpose in life and life satisfaction may be based on the relatively high correlations among these constructs ( $r_{\text{Study 2}} = 0.62$ ;  $r_{\text{Study 3}} = 0.72$ ). Despite the magnitude of these correlations, researchers have conceptualized these constructs differently, with purpose in life representing an important aspect of eudaimonic well-being (which emphasizes the fulfillment of personal potential through meaningful pursuits; Ryff & Singer, 2008) and life satisfaction representing an aspect of hedonic well-being (which emphasizes happiness and the attainment of pleasure over pain; Ryan & Deci, 2001). Importantly, previous research has provided evidence for the uniqueness of these constructs (e.g., Scheier et al., 2006). While the correlation between purpose in life and life satisfaction is often high, its magnitude is not so high as to suggest that the constructs are redundant.

It is possible, moreover, that the direction of our exploratory mediation analyses with purpose in life and life satisfaction (Studies 2 and 3) might operate in the reverse way, as both of these studies were cross-sectional. Based on earlier work by Mens and Scheier (2015), however, it seems at least somewhat plausible that perceptions of purpose might inform people's life satisfaction judgments. These authors found in a prospective study that changes in purpose in life over an 8-month period mediated the link between being able to re-engage in new goals at baseline and greater well-being 8 months later.

Despite these limitations, our results present a fairly consistent picture across different types of samples, suggesting that locomotion was associated with greater perceptions of purpose, while assessment (at least as measured by the RMQ) was associated with lower perceptions of purpose. Exploratory analyses suggested that locomotion and assessment might be associated with life satisfaction judgments through purpose in life, although the direction of this association should be explored further.

Of course, important questions remain to be answered in future research. For example, does engagement in any goal-directed activity give people a sense of purpose in life? Would the perception that one is engaging in many lower-level activities (e.g., doing one's homework for Class A and studying for a test in Class B) accumulate as much purpose as the perception that one is engaging in perhaps fewer, but higher-level, activities (e.g., growing as a person)? Moreover, would the actual attainability of one's goals matter for deriving a sense of purpose from them? Perceived attainability, of course, should matter because a person is unlikely to initiate action and go after a goal that he cannot, at the very least, hope to attain (e.g., Carver & Scheier, 1998; Kruglanski, 1996; Kruglanski & Köpetz, 2009; Rasmussen, Wrosch, Scheier, & Carver, 2006; Richter, Friedrich, & Gendolla, 2008). Yet, would a person need to attain his or her goals to feel a sense of purpose? Or, may initiating action toward attaining these goals or remaining goal-engaged suffice? These all seem to be fruitful questions to pursue in future research.



## 7. Statements

- Informed consent was obtained from all human subjects.
- We wish to confirm that there are no known conflicts of interest associated with this publication and there has been no significant financial support for this work that could have influenced its outcome.
- This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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