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## Who self-initiates gratitude interventions in daily life? An examination of intentions, curiosity, depressive symptoms, and life satisfaction

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### ABSTRACT

Despite a variety of interventions to increase well-being, little is known about who is interested in and initiates exercises on their own. We explored individual differences that predict who is most likely to participate in a voluntary gratitude intervention. College students ( $n = 226$ ) completed measures of curiosity, depressive symptoms, life satisfaction, and intentions to change their lifestyle. Afterwards, participants received a personalized invitation to take part in a web-based intervention to enhance their well-being (anonymous and strictly voluntary). Results suggested that 11.5% of participants started the gratitude intervention. Individuals endorsing strong intentions to change their lifestyle (+1 *SD* above mean) were 2.2 times more likely than their peers to start the gratitude intervention. People with greater trait curiosity endorsed greater intentions to start this intervention; people with greater depressive symptoms endorsed weaker intentions. Both curiosity and depressive symptoms indirectly influenced initiation of the gratitude intervention via intentions. These findings provide support for particular paths that lead to the initial behavioral effort towards healthy change. We discuss the implications for attempting to increase and sustain people's well-being.

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In the past 35 years, researchers have created nearly 100 exercises to directly enhance positive emotions, happiness, and character strengths such as gratitude (e.g., Seligman, Steen, Park, & Peterson, 2005; Sin & Lyubomirsky, 2009). A considerable number of gratitude interventions have been shown to be efficacious (Wood, Froh, & Geraghty, 2010). To date, researchers have limited their research designs to controlled trials where participants are assigned to take part in an intervention (or not). There is an absence of research on who is interested in well-being enhancing interventions and in turn, initiates them on their own. The first step to becoming happier and more grateful is a desire to change. The second step is taking action to initiate change. We explored the link between intentions and actual change, with consideration of individual differences that influence the likelihood of starting a gratitude intervention.

### 1. Science of gratitude

Gratitude occurs when an individual attends to the benefits and gifts that are attributable to the kindness of others (McCullough,

Kilpatrick, Emmons, & Larson, 2001). Gratitude has been associated with less frequent negative emotions, more frequent positive emotions, greater meaning in life, better strategies to cope with life stress, and healthier social relationships (e.g., DeWall, Lambert, Pond, Kashdan, & Fincham, 2012; McCullough, Emmons, & Tsang, 2002).

By intentionally attending to moments of gratitude each day over the course of a week, individuals experience greater well-being for periods ranging from one week to six months (e.g., Emmons & McCullough, 2003; Seligman et al., 2005). One particular benefit of gratitude interventions is that they are easily conducted over the internet at low financial cost and time burden for participants. Although there is a growing body of evidence for the efficacy of gratitude interventions, including online interventions (Emmons & McCullough, 2003; Froh, Kashdan, Ozimkowski, & Miller, 2009; Seligman et al., 2005), there is no study to our knowledge that examined the question of who initiates gratitude exercises on their own. To address this issue in the present study, we separated intentions from actual behavior, to better understand the nature of self-change.

### 2. Distinguishing intention and behavior

Intentions reflect the extent that individuals are interested in exerting effort to perform a certain behavior (Ajzen, 1991).

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Theorists have argued that greater intention to complete exercises to increase well-being accounts for substantial variance in the efficacy of well-being interventions (Lyubomirsky, Dickerhoof, Boehm, & Sheldon, 2011). Failing to account for intention as an antecedent of behavior misses crucial information about which individuals are likely to initiate and complete a gratitude intervention.

The relationship between intentions and actions is straightforward if the behavior is completely under volitional control (Ajzen, 1991). If the psychological or physical resources necessary to control behavior are unavailable, the association between intentions and actual behavior can be tenuous. The availability of necessary resources to initiate interventions is a neglected variable in trying to understand well-being interventions. Experimental studies, with participants assigned to gratitude intervention or comparison conditions, have provided insights into the malleability of gratitude (Emmons & McCullough, 2003; Froh et al., 2009; Lyubomirsky et al., 2011; Seligman et al., 2005). But the constraints of laboratory designs limit researchers' ability to extrapolate how people engage in interventions on their own under real-life circumstances where there are natural stressors and barriers that need to be overcome. Certain individual difference factors might increase the probability of behavioral change.

### 3. Curiosity

Curious individuals are predisposed to recognizing and seeking out new information and experiences (Loewenstein, 1994). Prior research suggests that curiosity is associated with greater life satisfaction (Peterson, Ruch, Beermann, Park, & Seligman, 2007) and self-regulation (Thoman, Smith, & Silvia, 2011). One reason that curious individuals experience greater well-being is that they are more motivated and willing to initiate new behaviors that might be rewarding (Spielberger & Starr, 1994).

Curious people may be more likely to initiate an activity that might increase their well-being because they believe they have the ability to effectively cope with or make sense of the novelty, distress, and uncertainty that accompanies lifestyle changes (Silvia, 2005, 2008). Curious individuals intentionally choose activities that can stretch and develop their skills and potential. They show a greater tendency to approach rather than avoid activities with uncertain outcomes. If curious individuals intentionally initiate novel activities requiring effort expenditure then we might expect a greater intention to experiment with well-being interventions.

### 4. Depressive symptoms

In a recent meta-analysis, researchers found that individuals with greater depressive symptoms benefit more from well-being exercises possibly because they have more "room to grow" (Sin & Lyubomirsky, 2009). Recent research suggests that people with greater depressive symptoms are more likely to seek out happiness interventions via self-help books and web-based interventions (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012). Yet, greater depressive symptoms predict decreased motivation, reactivity to, and participation in rewarding activities (e.g., Bylsma, Morris, & Rottenberg, 2008). For example, diagnoses of depression are associated with less physical activity (Goodwin, 2003) and decreased approach-related motivation (e.g., Forbes & Dahl, 2012). With two competing hypotheses, our study can be considered an exploration of whether depressive symptoms have an inhibiting or enabling effect on behavioral intentions and the actual initiation of well-being exercises.

### 5. Life satisfaction

Life satisfaction has been positioned as a central component of well-being, along with positive and negative emotions (Diener & Lucas, 1999). Although heavily researched as an outcome variable, little attention has been given to life satisfaction as a predictor of lifestyle changes. There are several reasons why life satisfaction might be relevant to the initiation of gratitude interventions. First, individuals with greater life satisfaction might be less motivated to increase their well-being since they are, by definition, already satisfied with their life. Second, there is evidence that grateful individuals experience greater life satisfaction (Emmons & McCullough, 2003). This means that individuals with greater life satisfaction tend to experience frequent, intense gratitude and are unlikely to start an intervention designed to further increase gratitude.

### 6. The current study

Building on prior work in clinical and health psychology (Ajzen, 1991; Prochaska & Velicer, 1997) we tested the degree to which intentions to improve one's lifestyle predicted actual behavior to increase gratitude via an online intervention. Unlike prior gratitude intervention work, participants were not assigned to a gratitude intervention, instead participants were informed about the presence of an available, voluntary intervention. Second, we explored three individual difference factors—curiosity, depressive symptoms, and life satisfaction—that might influence both intentions and the actual initiation of gratitude exercises. We focused on curiosity because this construct reflects the urge to seek out and thrive on novel interactions with the world (Kashdan et al., 2009). Curiosity can serve as the motivation for experimenting with new strategies that might enhance well-being. As additional individual differences, depression was included because depressed people show deficits in approach motivation and reward sensitivity and greater life satisfaction was included because happier people are inclined to keep the status quo (which is working well for them). We expected individuals with greater curiosity to form higher intentions to start well-being exercises that in turn, influences actual behavioral effort. We also hypothesized that life satisfaction would be related to less intention to start a well-being intervention and in turn, actual initiation of a gratitude intervention.

### 7. Method

#### 7.1. Participants

Participants were 226 undergraduates (71.2% female) from a university in Poland between the ages 18 and 29 years ( $M = 21.36$ ,  $SD = 1.66$ ). Groups of students were approached before classes by experimenters. Volunteers remained anonymous and were not offered incentives. Offering no incentives such as research credit in classes (popular in western countries) is common for brief surveys completed by students for scientific purposes in Poland.

Seven participants were excluded for failing to complete the intention questionnaire. Missing data from remaining participants (<1%) were determined to be random via Little's (1988) chi-square test,  $\chi^2(100) = 78.73$ ,  $p = .943$ , except for depressive symptoms,  $\chi^2(151) = 239.03$ ,  $p < .001$ . Yet, only seven participants omitted a single depressive symptom item. Missing values were imputed using Expectation-Maximization algorithm (Enders, 2001) in SPSS 20.

#### 7.2. Procedure

Assembled in groups participants reported their age and gender and completed self-report questionnaires. Next they received a

single leaflet about 'positive life practices'. In the leaflet, participants were informed that positive life practices are about "starting new habits that can increase their well-being". They were informed that if they wanted to try out a positive life practice they should enter a dedicated website with instructions within the next seven days. Subsequently, each participant was asked to report their intentions to initiate the positive life practice.

### 7.3. Measures

The 10-item *Curiosity and Exploration Inventory-II* (CEI-II; Kashdan et al., 2009) included five items for stretching, assessing the degree to which people tend to seek out new knowledge and experiences (e.g., 'Everywhere I go, I am out looking for new things or experiences') and five for embracing, assessing the willingness to tolerate the novelty and uncertainty of their environment (e.g., 'I am the type of person who really enjoys the uncertainty of everyday life'). Ratings were completed using a 5-point scale from 1 'very slightly or not at all' to 5 'extremely'. Because subscales were strongly correlated ( $r = .72, p < .001$ ), we used a composite mean score ( $\alpha = .86$ ). Prior research in laboratory and daily diary studies provide support for the reliability and validity of this scale (Kashdan, McKnight, Fincham, & Rose, 2011; Kashdan et al., 2013; Kashdan & Steger 2007).

The 20-item *Center for Epidemiologic Studies Depression Scale* (CES-D; Radloff, 1977) measured depressive symptoms. This scale consists of a list of symptoms such as 'I had crying spells' and how much they occurred over the last 7 days. Participants reported the frequency of these symptoms using a scale ranging from 0 'rarely or none of the time (less than 1 day)' to 3 'most of the time or all the time (5–6 days)'. We used the mean score. The validity of the CES-D has been established by strong positive associations with clinician ratings, semi-structured interviews, and other self-report measures of depression (Radloff, 1977) ( $\alpha = .84$ ).

The 5-item *Satisfaction with Life Scale* (Diener, Emmons, Larson, & Griffin, 1985) measured global cognitive judgments of one's life, an example being 'The conditions of my life are excellent'. The answering scale ranges from 1 – 'strongly disagree' to 7 'strongly agree'. We used the mean score. As evidence of validity, this scale has been shown to be correlated with other self-report, informant reports, and behavioral indicators of well-being (Diener et al., 1985) ( $\alpha = .82$ ).

The 6-item *Initiative to Start Life Enhancing Exercises* scale asked about participants' belief that they would try out web-based exercises to improve their quality of life. The items comprised specific actions in the intervention: 'enter the intervention website', 'read information from the website', 'learn more about life enhancing exercises', 'try out the life enhancing exercise', 'complete the life enhancing exercise', 'introduce the life enhancing exercise as a part of my life-style'. Items were preceded by a phrase 'I intend to...' Participants used a 7-point scale from 1 'completely disagree' to 7 'completely agree' and the mean score was used in analyses. Items were developed by creating six sequential steps for the behavior of interest fitting with theories of planned behavior and prior approaches to developing scales of behavioral intentions (Francis et al., 2004) ( $\alpha = .94$ ).

### 7.4. Gratitude intervention

At the end of each of three consecutive days, participants were asked to write about three good things that had happened to them. Additionally, they were asked to reflect on causal explanations to each good thing. This procedure followed the paradigm used by Seligman et al. (2005). They entered a dedicated website with detailed instructions on how to perform the task and with boxes

where they typed their entries (i.e., person or object of their gratitude).

At baseline, participants received an invitation with individual pin-codes to access the gratitude intervention website which allowed them to be anonymously tracked throughout the study. A participant was classified as initiating the gratitude intervention if he or she completed at least the first daily entry. Because the gratitude intervention requires Internet access, we measured accessibility and frequency of internet use. Participants used a 7-point scale from 1 'completely disagree' to 7 'completely agree' to report if they use the internet as often as they wish, their internet access is free and easy, and whether they possess privacy when using a computer (three items) ( $\alpha = .78$ ), and the frequency of internet use with a response format ranging from one "less than once a month" to six "every day or almost every day".

### 7.5. Analytical strategy

We used path analyses to test if intentions predicted initiation of gratitude exercises, and whether individual difference factors predicted intentions or initiation of gratitude exercises (Hayes, 2012). Path analysis with bootstrapping is a common statistical technique of model testing in the literature (e.g., Wiedemann, Schüz, Sniehotta, Scholz, & Schwarzer, 2009). All parameter estimates were generated using ordinary least squares (OLS) regression. Coefficients were estimated from a maximum likelihood logistic regression, which was a strategy adequate for the binary outcome (did the person initiate the gratitude intervention?). First, we regressed behavior on intention. Second, curiosity, depressive symptoms, life satisfaction, and Internet accessibility were entered as predictors of both intention and behavior. If any individual differences predicted intentions, we examined indirect effects leading to subsequent behavior. For instance, to test the indirect effects of curiosity on behavior through intentions we used the PROCESS computational tool (Hayes, 2012) with 5000 bias-corrected bootstrapped samples. Bootstrapping produces point estimates and confidence intervals (CI) for the direct and indirect effects. Significant effects were indicated by confidence intervals that do not include zero.

## 8. Results

Descriptive statistics are presented in Table 1. Our results indicate that most of the participants reported access to the Internet and privacy for this study participation. Notably, 215 (96.4%) of participants who used the internet on a daily basis, 67 (29.6%) visited the website, 26 (11.5%) initiated, 8 (3.5%) continued, and 6 (2.7%) completed the gratitude exercises. As shown in Table 1, intentions to start the gratitude intervention were related to each predictor (except internet accessibility). Because women were

**Table 1**  
Descriptive statistics and inter-correlations among study variables.

	1	2	3	4	5	6
1. Curiosity						
2. Depressive symptoms	-.15*					
3. Life satisfaction	.36**	-.54**				
4. Internet access	.13	-.06	.16*			
5. Intention	.33**	-.19**	.16*	.12		
6. Behavior	.02	.02	-.04	-.12	.19**	
7. Age	-.02	-.09	.06	.06	.07	-.03
8. Gender	.12	-.01	.15*	.06	.23*	.07
M	3.34	0.83	4.12	6.35	4.34	–
SD	0.66	0.57	1.05	1.06	1.39	–
VIF	1.19	1.43	1.60	1.03	1.15	–

\*  $p < .05$ .

\*\*  $p < .01$ .

more satisfied with life and endorsed higher intentions, we included gender as a covariate.

Our path model in Fig. 1 indicates that curiosity was positively related to intentions to engage in the intervention, depressive symptoms were negatively related to intentions, and life satisfaction was not significantly associated with intentions. Women were more likely to endorse high intentions. Due to the absence of variance, Internet accessibility failed to predict intentions or behavior. Table 2 details the effects of individual difference variables on behavioral intentions. Initiation of the intervention was directly predicted by baseline intentions; no other variable significantly predicted behavior (see Table 3). There was a significant indirect effect of curiosity on intervention initiation via intentions, ( $b = 0.24$ , 99% CI [0.077, 0.542], OR = 1.29). We also found a marginal indirect effect of depressive symptoms on intervention initiation via intention, ( $b = -0.119$ , 90% CI [-0.309, -0.010], OR = 0.89). A significant indirect effect of gender on behavior through intentions, ( $b = 0.32$ , 95% CI [0.074; 0.777], OR = 1.38), indicated that women were more likely to initiate behavior due to higher intentions.

## 9. Discussion

This study demonstrates that there are meaningful individual differences in who is interested in using an intervention to improve their life and in turn, who starts a gratitude intervention on their own. Extending prior work on behavioral change (Ajzen, 1991; Markland, Ryan, Tobin, & Rollnick, 2005; Prochaska & Velicer, 1997), we found that behavioral intentions significantly influenced whether individuals started the gratitude intervention. Compared to less motivated peers, individuals with strong intentions to change were twice as likely to take action. We found that individuals endorsing greater dispositional curiosity were more motivated to change their lifestyle that in turn, predicted actual behavior change. In addition, we found marginal evidence that depressive symptoms predicted less behavioral intentions and in turn, a lower probability of starting the gratitude intervention. None of the personality traits directly predicted behavior, suggesting that intention is a proximal predictor of behavior, and curiosity and depressive symptoms are distal, indirect predictors.

Why did curiosity predict intentions to engage in healthy lifestyle changes but not behavior change? Curious people are approach oriented and highly sensitive to rewards, particularly if the activity is novel, challenging, or uncertain (Silvia, 2005, 2008) but not so novel as to elicit fearful avoidance (Spielberger & Starr, 1994). Our online gratitude intervention fit these criteria. Curiosity might increase approach motivation or behavioral intentions but there are practical constraints that are likely to interfere with the

**Table 2**  
Results of linear regression model to predict behavioral intentions.

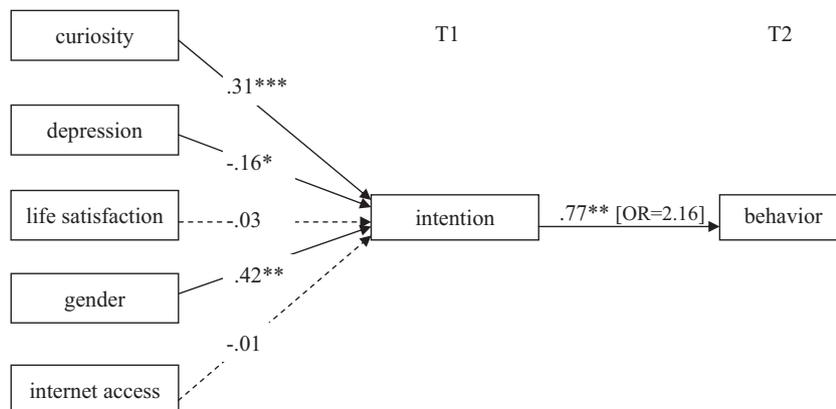
	<i>b</i>	SE <i>b</i>	<i>t</i>	<i>p</i>	95% CI	
					Lower	Upper
Trait curiosity	0.31	0.07	4.56	<.001	0.18	0.44
Depressive symptoms	-.15	0.07	-2.24	.026	-0.31	-0.02
Life satisfaction	-0.07	0.08	-0.91	.361	-0.23	0.08
Gender	0.42	0.14	2.94	.004	0.14	0.70
Internet access	-0.01	0.06	-0.15	.883	-0.13	0.11

Note. Full model  $R^2 = 0.16$ ,  $F(5, 213) = 8.30$ ,  $p < .001$ . Gender was coded as 0 = male, 1 = female.

initiation of a gratitude intervention. College students were given a website and password to start the intervention at a later date. Their initial interest might have waned by the lack of immediate gratification as attention returned to their studies, work, social relationships, and other daily obligations. Theorists have argued that momentary curiosity is often intense but transient (Loewenstein, 1994). More research is needed on how to bridge the gap from curiosity triggered in the moment (state curiosity) to persistent interest (trait curiosity). The degree to which curiosity is malleable determines the value of using curiosity to influence adherence to well-being interventions.

We also found evidence that depressed individuals were less likely to initiate the intervention. Depression is generally associated with less interest in previously enjoyable activities, and deficits in approach motivation (Bylsma et al., 2008). Researchers have also found that depressed individuals are more likely to benefit from interventions that directly target positive emotions such as gratitude (Sin & Lyubomirsky, 2009). Taken together, these results suggest that individuals who tend to extract the greatest benefits from a gratitude intervention are the least likely to actually begin such an intervention. Depressed individuals might benefit less from gratitude interventions because the active treatment requires intense effort.

Our results suggest practical implications: it is imperative to find ways to get depressed individuals to begin interventions that focus on positive emotions and social behaviors. Given that curiosity predicted intentions directly and behaviors indirectly, we offer the possibility that instilling curiosity in depressed individuals might motivate them to initiate well-being interventions. Motivational interviewing is one such strategy where curiosity is used to initiate behavior change (Miller & Rollnick, 2002). Individuals are asked for reasons for and against changing versus staying the same, whether and how behavior conflicts with central values and any conflict is highlighted and explored with a non-judgmental,



**Fig. 1.** A model for initiating gratitude exercises. (Note: Paths leading to behavior represent logistic regression coefficients. OR = odds ratio. Gender was coded as 0 = male, 1 = female. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ .)

**Table 3**  
Results of binominal analyses to predict self-initiated gratitude intervention.

	b	SE b	Wald $\chi^2$	p	OR	95% CI for OR	
						Lower	Upper
Full model			6.38	<.01			
Behavioral intention	0.77	0.29	7.06	.008	2.16	1.22	3.83
Trait curiosity	−0.03	0.26	0.01	.909	0.97	0.59	1.60
Depressive symptoms	−0.01	0.26	0.01	.973	0.99	0.59	1.65
Life satisfaction	−0.22	0.27	0.63	.428	0.80	0.47	1.39
Gender	0.30	0.55	0.30	.584	1.36	0.46	4.02
Internet access	−0.09	0.20	0.21	.647	0.91	0.61	1.36

Notes. The dependent variable of participating in the gratitude intervention was binary (yes/no). OR = odds ratio. Gender was coded as 0 = male, 1 = female.

curious lens. Such therapeutic strategies revolve around turning curiosity inward to better understand thoughts, feelings, and behaviors in the pursuit of psychological flexibility (Hayes, Strosahl, & Wilson, 1999).

Due to study limitations, our results should be interpreted with caution. First, we used an undergraduate convenience sample and cannot conclude how participants differed from individuals who refused initial requests to complete a survey. Although gratitude interventions have been successfully applied for various groups of participants such as youth (Froh et al., 2009), patients with neuromuscular disease (Emmons & McCullough, 2003) or internet users (Seligman et al., 2005) it remains to be seen whether the current model of self-experimentation with well-being interventions is generalizable. Another important question is whether demographic factors and additional individual differences (such as self-discipline, ambition, need for achievement, and sense of belonging) influence the initiation and effectiveness of gratitude interventions. Second, we measured a general intention to start a well-being intervention online and subsequently offered a gratitude exercise. As a result, our findings related to intentions are broadly applicable to well-being web-based interventions, whereas our findings on behavioral effort are specific to being exposed to a gratitude exercise. Third, we used lenient criteria to evaluate self-initiation of behavior change. Participants only had to complete one day of the gratitude intervention, and still, only 11.5% of participants started the gratitude exercises. Promising research on the characteristics of “happiness seekers” has recently been collected (Parks et al., 2012) with evidence that these individuals tend to be more depressed than people with no interest in happiness interventions. Researchers will gain a better understanding of who does and does not participate in self-initiated interventions by conducting follow-up assessments on the reasons behind decision-making.

One of the strengths of this study is that by separating intentions from behavior we revealed paths from personality to an objective outcome (starting a gratitude intervention).

Relatively little is known about how personality traits influence intentions and actual behavior to start a well-being enhancement program, yet much is known about short-term efficacy. By understanding the psychological and resource factors that increase the likelihood that the introduction of an intervention will lead to actual behavior change, it becomes increasingly possible to improve people's well-being.

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### References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50, 179–211.
- Bylsma, L. M., Morris, B. H., & Rottenberg, J. (2008). A meta-analysis of emotional reactivity in major depressive disorder. *Clinical Psychology Review*, 28, 676–691.
- DeWall, C. N., Lambert, N. M., Pond, R. S., Jr., Kashdan, T. B., & Fincham, F. D. (2012). A grateful heart is a non-violent heart: Cross-sectional, experience sampling, longitudinal, and experimental evidence. *Social Psychological and Personality Science*, 3, 232–240.
- Diener, E., Emmons, R. A., Larson, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 1985(49), 71–75.
- Diener, E., & Lucas, R. E. (1999). Personality and subjective well-being. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology*. New York: Russell Sage.
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: An experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology*, 84, 377–389.
- Enders, C. K. (2001). A primer on maximum likelihood algorithms available for use with missing data. *Structural Equation Modeling*, 8, 128–141.
- Forbes, E. E., & Dahl, R. E. (2012). Research review: Altered reward function in adolescent depression: What, when and how? *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 53, 3–15.
- Francis, J. J., Eccles, M. P., Johnston, M., Walker, A. E., Grimshaw, J. M., Foy, R., et al. (2004). *Constructing questionnaires based on the theory of planned behaviour. A manual for health services researchers*. UK: Centre for Health Services Research, University of Newcastle upon Tyne.
- Froh, J. J., Kashdan, T. B., Ozimkowski, K. M., & Miller, N. (2009). Who benefits the most from a gratitude intervention in children and adolescents? Examining positive affect as a moderator. *The Journal of Positive Psychology*, 4(5), 408–422.
- Goodwin, R. D. (2003). Association between physical activity and mental disorders among adults in the United States. *Preventive Medicine*, 36, 698–703.
- Hayes, A. F. (2012). *PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]*. Retrieved from <http://www.afhayes.com/public/process2012.pdf>.
- Hayes, S. C., Strosahl, K., & Wilson, K. G. (1999). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Kashdan, T. B., DeWall, C. N., Pond, R. S., Silvia, P. J., Lambert, N. M., Fincham, F. D., et al. (2013). Curiosity protects against interpersonal aggression: Cross-sectional, daily process, and behavioral evidence. *Journal of Personality*, 81, 87–102.
- Kashdan, T. B., Gallagher, M. W., Silvia, P. J., Winterstein, B. P., Breen, W. E., Terhar, D., et al. (2009). The curiosity and exploration inventory-II: Development, factor structure, and psychometrics. *Journal of Research in Personality*, 43, 987–998.
- Kashdan, T. B., McKnight, P. E., Fincham, F. D., & Rose, P. (2011). When curiosity breeds intimacy: Taking advantage of intimacy opportunities and transforming boring conversations. *Journal of Personality*, 79, 1369–1401.
- Kashdan, T. B., & Steger, M. F. (2007). Curiosity and pathways to well-being and meaning in life: Traits, states, and everyday behaviors. *Motivation and Emotion*, 31, 159–173.
- Little, R. J. A. (1988). A test of missing completely at random for multivariate data with missing values. *Journal of the American Statistical Association*, 83, 1198–1202.
- Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin*, 116, 75–98.
- Lyubomirsky, S., Dickerhoof, R., Boehm, J. K., & Sheldon, K. M. (2011). Becoming happier takes both a will and a proper way: An experimental longitudinal intervention to boost well-being. *Emotion*, 11, 391–402.
- Markland, D., Ryan, R. M., Tobin, V., & Rollnick, S. (2005). Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology*, 24, 811–831.
- McCullough, M. E., Emmons, R. A., & Tsang, J. (2002). The grateful disposition: A conceptual and empirical topography. *Journal of Personality and Social Psychology*, 82, 112–127.
- McCullough, M. E., Kilpatrick, S. D., Emmons, R. A., & Larson, D. B. (2001). Is gratitude a moral affect? *Psychological Bulletin*, 127, 249–266.
- Miller, W. R., & Rollnick, S. P. (2002). *Motivational interviewing: Preparing people for change* (second edition). New York: Guilford Press.
- Parks, A., Della Porta, M., Pierce, R. S., Zilca, R., & Lyubomirsky, S. (2012). Pursuing happiness in everyday life: The characteristics and behaviors of online happiness seekers. *Emotion*, 12, 1222–1234.
- Peterson, C., Ruch, W., Beermann, U., Park, N., & Seligman, M. E. P. (2007). Strengths of character, orientations to happiness, and life satisfaction. *Journal of Positive Psychology*, 2, 149–156.
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion*, 12, 38–48.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Seligman, M. E. P., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress. Empirical validation of interventions. *American Psychologist*, 60, 410–421.
- Silvia, P. J. (2005). What is interesting? Exploring the appraisal structure of interest. *Emotion*, 5, 89–102.

- Silvia, P. J. (2008). Appraisal components and emotion traits: Examining the appraisal basis of trait curiosity. *Cognition and Emotion, 22*, 94–113.
- Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: A practice-friendly meta-analysis. *Journal of Clinical Psychology, 65*, 467–487.
- Spielberger, C. D., & Starr, L. M. (1994). Curiosity and exploratory behavior. In H. F. O'Neil, Jr. & M. Drillings (Eds.), *Motivation: Theory and research*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.
- Thoman, D. B., Smith, J. L., & Silvia, P. J. (2011). The resource replenishment function of interest. *Social Psychological and Personality Science, 2*, 592–599.
- Wiedemann, A. U., Schüz, B., Sniehotta, F., Scholz, U., & Schwarzer, R. (2009). Disentangling the relation between intentions, planning, and behaviour: A moderated mediation analysis. *Psychology and Health, 24*(1), 67–79.
- Wood, A. M., Froh, J. J., & Geraghty, A. W. A. (2010). Gratitude and well-being: A review and theoretical integration. *Clinical Psychology Review, 30*, 890–905.