

It's Not Just the Amount That Counts: Balanced Need Satisfaction Also Affects Well-Being

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The basic psychological needs for autonomy, competence, and relatedness have been found to have unique additive effects on psychological well-being (see E. L. Deci & R. M. Ryan, 2000). In the present study, the authors extended these findings by examining whether the *balance* in the satisfaction of these 3 needs is also important. The results of 4 studies showed that people who experienced balanced need satisfaction reported higher well-being than those with the same sum score who reported greater variability in need satisfaction. This finding emerged for multiple measures of needs and adjustment and was independent of neuroticism. Moreover, results were obtained consistently across concurrent, prospective, daily diary, and observer-report study designs. Discussion focuses on the psychological meaning and functional implications of balanced need satisfaction.

Keywords: life balance, need satisfaction, well-being

Psychological needs theories have had a long and checkered history in psychology, dating back to McDougall (1908), Murray (1938), and Maslow (1971). Although the concept of psychological needs provides a promising framework for understanding the antecedents of human thriving, disagreements on the definition and conceptualization of needs have slowed the progress in realizing this potential (Ryan, 1995). For example, needs theorists differ widely in their view of whether psychological needs are variable in their importance for different people, versus largely invariant; whether needs are expressive motives that impel people toward certain types of incentives in the environment, versus experiential requirements necessary for people to thrive; whether needs are acquired during the process of individual development, versus evolved and inherited; and whether needs are few in number, versus multitudinous in number (Sheldon, Ryan, & Reis, 1996).

Recently, research based in the self-determination theory (SDT; Deci & Ryan, 1985, 2000) tradition has led to an upsurge in interest in the concept of psychological needs (see also Baumeister & Leary, 1995; Brewer, 1991; Sheldon, 2004). According to SDT, psychological needs are evolved experiential requirements that all people must have in order to grow to their fullest potential, in the same way that plants require key nutrients (i.e., soil, sun, water) to thrive (Ryan, 1995). SDT postulates the existence of three basic psychological needs—autonomy, competence, and relatedness—and proposes that each is a distinct necessity for psychological health (Ryan, 1995). The need for autonomy (deCharms, 1968) refers to the experience that behavior is owned and endorsed “at the highest level of reflection” (see also Deci & Ryan, 2000). Competence (White, 1959) refers to the need to feel effective,

efficient, and masterful vis-à-vis the environment. Relatedness (Baumeister & Leary, 1995) refers to the need to feel understood, connected with, and appreciated by close others.

Considerable research now supports the SDT proposal that all three needs are important. For example, the simultaneous experience of autonomy, competence, and relatedness has been shown to contribute to people's reports of fulfillment from satisfying events (Sheldon, Elliot, Kim, & Kasser, 2001), good days (Sheldon et al., 1996), secure attachments (LaGuardia, Ryan, Couchman, & Deci, 2000), and college classroom experiences (Filak & Sheldon, 2003). Moreover, need satisfaction contributes to the experience of heightened psychological and physical health in a variety of domains, including the workplace (e.g., Baard, Deci, & Ryan, 2004; Ilardi, Leone, Kasser, & Ryan, 1993; Vansteenkiste et al., in press), athletics (e.g., Gagné, Ryan, & Bargmann, 2003), and general health practices (e.g., Williams et al., 2006; Williams, McGregor, Zeldman, Freedman, & Deci, 2004), as well as across the life span, from adolescents (e.g., Niemiec et al., in press) to older persons (e.g., Kasser & Ryan, 1999). Finally, the proposition that all three needs are essential has been supported in both Eastern and Western cultures (e.g., Deci et al., 2001; Sheldon et al., 2001), at both within- and between-person levels of analysis (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000), and in both cross-sectional and longitudinal designs (Sheldon & Elliot, 1999).

The SDT approach provides a framework for resolving many perennial questions that concern psychological needs. The first question, which was alluded to above, is as follows: If a posited need varies drastically in its importance for different people, then is it really a necessary antecedent for psychological health, or is it merely an idiosyncratic desire? According to SDT, the fundamental needs should not vary much in their importance for different people, a position bolstered by the increasing prominence of evolutionary perspectives that focus on the universal and species-typical features of human nature (Buss, 2000; Deci & Ryan, 2000). In other words, all people require certain types of experiences to approximately the same extent—what varies is the extent to which they manage to get such satisfaction. Thus, the SDT perspective

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differs considerably from the motive disposition (or social motive) tradition (McClelland, 1985), which focuses on acquired individual differences in the strength of motives such as achievement, power, intimacy, or affiliation (McAdams, 2001). Simply stated, in the SDT model, needs are invariant required inputs, rather than varying motivated outputs.

A second perennial question, which is related to the first, is as follows: If needs are adaptive motives that facilitate psychological health, then why do some people focus their energies in ways that are unsatisfying and even maladaptive? According to SDT, needs are experiential requirements, not behavioral motives. Because there is no a priori connection between motivated behavior and resultant need satisfaction, people can sometimes pursue the “wrong” goals—that is, goals that do not meet their needs (Sheldon, 2004). For example, Niemiec, Ryan, and Deci (2006) found that changes in the attainment of intrinsic, but not extrinsic, life goals during a 1-year period were strongly related to changes in need satisfaction and psychological health during the same period of time, which supports the SDT position that not all goal attainment is equally beneficial for need satisfaction and well-being (Ryan, Sheldon, Kasser, & Deci, 1996).

A third perennial question is as follows: If needs really are necessary for psychological health, then shouldn't a high level of need satisfaction predict well-being? Some previous theoretical approaches have not incorporated this idea, and indeed some previously postulated needs may actually be damaging to human integrity (e.g., Murray's [1938] proposed “needs” for abasement and aggression). From the SDT perspective, needs are essential for well-being and therefore should be validated, in part, by their association with psychological health (Baumeister & Leary, 1995; Ryan, 1995). Thus, if a particular type of experience does not facilitate the adjustment of nearly everyone who has it, then that experience is probably not a psychological need.

The Balance of Need Satisfaction

We hoped to contribute new information to this emerging synthesis by examining the *balance* of need satisfaction in addition to the total *amount* of need satisfaction. Although balance has received no prior research attention, there is reason to hypothesize that it may be an important determinant of well-being (see Sheldon, 2004, p. 199).

Again, SDT posits that the satisfaction of all three needs is essential for the experience of psychological health, a proposal that has been supported in many studies using a wide variety of outcomes. Often, the basic psychological needs will be satisfied to an approximately equal extent. However, at some times, people's lives may become configured such that they experience an imbalance in their levels of need satisfaction. For example, suppose that the owner of a new business must work very long hours to pursue his dream. He is his own boss, and thus he experiences very good satisfaction of his need for autonomy (e.g., a score of 6 on a scale ranging from 1 to 7). Moreover, his business has grown quite successful, and thus he experiences very good satisfaction of his need for competence (e.g., a 6). However, he is unable to spend much time with his family and friends, and thus he experiences low satisfaction of his need for relatedness (e.g., a 3). Therefore, the sum score of need satisfaction for the entrepreneur is 15.

In contrast, consider a mother who has put aside her career to raise her children. In planning her own days and enjoying her

children, she experiences good satisfaction of her needs for autonomy and relatedness (i.e., 5s on both). She also works a 15-hr per week job at which she is successful, and thus she experiences good satisfaction of her need for competence (e.g., a 5). Note that the sum score of need satisfaction for the mother is also 15. An important question thus concerns whether the greater balance in need satisfaction experienced by the mother is more facilitative of psychological health, even though both she and the entrepreneur experience the same total amount of need satisfaction.

Although no previous research has examined the relation of balanced need satisfaction to well-being, work in other domains suggests that internal variability is problematic for psychological health. For example, Paradise and Kernis (2002) found that unstable self-esteem was associated with less positive psychological functioning, particularly for people with high self-esteem. Self-verification research (Swann, 1990) has shown that people desire, and benefit from, consistency in their self-concept, and self-discrepancy research has shown that people are happier when they do not perceive discrepancies between how they and others see them (Campbell, Assanand, & Di Paula, 2003). Donahue, Robins, Roberts, and John (1993) found that people experienced heightened ill-being when their self-concepts were more differentiated or variable across roles, and Sheldon and Emmons (1995) found that greater differentiation across personal goals predicted negative goal outcomes. Thus, it appears that within-person variability, over time or across contexts, in self-relevant constructs is detrimental to well-being.

The research cited above only indirectly addresses the balance hypothesis examined in the present research, which concerns variability among psychological needs that are presumed to be unique. Thus, we drew from the burgeoning literature on the consequences of life balance for psychological health to provide a more specific theoretical rationale for our hypothesis. According to the scarcity hypothesis (Chapman, Ingersoll-Dayton, & Neal, 1994), there exists a limited amount of time and energy that people can devote to different areas in their lives (e.g., work, family). The allocation of these resources to certain life domains leaves less time and energy available for other domains. Thus, when allocation of these resources is imbalanced across life domains (either because of inappropriate allocation or circumstances that mandate imbalanced allocation), there is insufficient time and energy that can be allocated to other important areas, creating stress and conflict that result in a variety of negative consequences for health and well-being (Adams, King, & King, 1996; Arye, 1992; Grant-Vallone & Donaldson, 2001; Noor, 2004; Rice, Frone, & McFarlin, 1992). In a similar manner, we propose that imbalance among the satisfaction of the psychological needs reflects inappropriate allocations of resources across the different domains of life, which may induce stresses and conflicts that ultimately detract from well-being.

Of course, there are other explanations for the balance effect, should it emerge. For example, balanced need satisfaction may reflect a person's engagement in harmonious, rather than obsessive, passions (e.g., Vallerand et al., 2003); emerging research suggests that obsessive passions can consume a person's life, engendering stress and role conflict that detract from well-being (Seguin-Levesque, Lalliberte, Pelletier, Blanchard, & Vallerand, 2003). The balance prediction may also be derived from eudaemonic (i.e., meaning-based), rather than the hedonic (i.e., pleasure-based), conceptions of thriving (Ryan & Deci, 2000; Sheldon, 2004; Waterman, 1993). Many eudaemonic philosophies espouse

balance, harmony, and temperance, whereas hedonic philosophies typically espouse intensity, quantity, and extremity. Finally, demonstrating the importance of balance would also support personality theories that focus on developing all sides of the self (Jung, 1971) and that advise people not to put all their eggs in one basket (Linville, 1987).

Study 1

To provide an initial test of these ideas, we assessed in Study 1 the psychological well-being of a large sample of participants using several measures of well-being, and we also assessed participants' concurrent satisfaction of autonomy, competence, and relatedness. Our first hypothesis was that satisfaction of the three needs would positively correlate with the well-being measures, replicating prior research showing that need satisfaction facilitates well-being. Our second hypothesis was that balance in satisfaction across the three needs would also correlate positively with well-being.

As we discuss in greater detail in the *Method* section, we computed balance in terms of the total divergence among the measures of satisfaction of autonomy, competence, and relatedness, where less divergence indicates more balance. Notably, however, as the total satisfaction of the three needs increased, there was less possible variation among the measures of the three needs. This would likely yield a statistical confound (i.e., a ceiling effect) that could have obscured the relation of balance to psychological health. To avoid this confound, we included the three measures of need satisfaction as main effects in the regression models, thereby controlling for the total amount of need satisfaction. Conveniently, this procedure enabled an evaluation of both of our Study 1 hypotheses within the same model.

As a second way of evaluating the robustness of the hypothesized relation, we also tested for curvilinear effects involving the three need satisfaction variables. We hoped to show that balance has a positive relation that persists even when response extremity (i.e., the tendency to give very low or very high ratings) is controlled. Such a tendency should be captured by including a squared product term for each of the three need satisfaction variables, thereby controlling for any nonlinear effects of response extremity on well-being. We made no predictions concerning the curvilinear effects of need satisfaction on well-being because these associations have not been reported previously. If balance remained a significant predictor after controlling for the nonlinear effects, it would suggest that balance is equally important for people with low, moderate, and high levels of need satisfaction.

Method

Participants and Procedure

Participants were 315 students (64% women) in an introductory psychology course at the University of Missouri who participated as part of a course requirement.¹ The mean age of the participants was 19 years, with a range from 18 to 44. The majority of the sample identified themselves as Caucasian (88%), and the rest of the sample was composed of African American (3%), Hispanic (4%), and other (4%). After signing up for the study, they were e-mailed a link to a survey that they completed online.

Measures

Well-being. We used the Positive Affect Negative Affect Scale (PANAS; Watson, Tellegen, & Clark, 1988) to assess participants' positive (10 items; e.g., "interested," "strong") and negative (10 items; e.g., "ashamed," "irritable") affect, using a scale ranging from 1 (*not at all*) to 5 (*all the time*). We used the Satisfaction With Life Scale (Diener, Emmons, Larsen, & Griffin, 1985) to assess participants' life satisfaction (five items; e.g., "I am satisfied with my life"), using a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Together, these scales assessed both the emotional and cognitive facets of well-being. All three measures asked participants about their "life in general." The reliability for each measure was as follows: positive affect $\alpha = .88$, negative affect $\alpha = .88$, and life satisfaction $\alpha = .84$. We computed an aggregate subjective well-being (SWB) score ($\alpha = .90$) by summing the positive affect and life satisfaction items and subtracting the negative affect items, following the recommendations of Diener and Lucas (1999) and the procedures of Sheldon and Elliot (1999) and Sheldon and Kasser (1998, 2001). We used the Subjective Happiness Scale (Lyubomirsky & Lepper, 1999) to assess participants' overall level of happiness (four items; e.g., "I consider myself a very happy person"), using a scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability for this measure was $\alpha = .83$.

Need satisfaction. The need satisfaction items used by Sheldon et al. (2001) assessed general experiences of autonomy (three items; e.g., "In my life, my choices are based on my true interests and values"), competence (three items; e.g., "In my life, I feel very capable in what I do"), and relatedness (three items; e.g., "In my life, I feel close and connected with other people who are important to me"). Responses were made on a 7-point Likert-type scale, ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The reliability for each subscale was as follows: autonomy $\alpha = .76$, competence $\alpha = .84$, and relatedness $\alpha = .88$.

To assess the balance of need satisfaction, we computed the difference between each pair of needs and then summed the absolute values of the three difference scores, which yielded a measure of the total divergence among the three scores. Similar statistical methodologies (e.g., focusing on the variance or on the standard deviation across the three scores) correlated highly with the absolute difference measure (i.e., $r > .93$) and yielded very similar results. Given the 7-point scale, the balance score could range from 0 (indicating equal satisfaction among the three needs) to 12 (indicating the maximum summed difference among the needs; e.g., as yielded by scores of 1, 4, and 7). The balance score was transformed by subtracting each participant's score from the highest observed score of 9; this created a variable in which higher scores corresponded to greater balance among the three needs.

Results and Discussion

Preliminary Analyses

Table 1 presents the means, standard deviations, and intercorrelations of the three measures of need satisfaction, the two measures of well-being, and the balance score. As expected, the three measures of need satisfaction and the balance score were positively correlated with the well-being measures as well as with each other. The fact that balance correlated positively with the measures of need satisfaction underscored the importance of controlling for level of satisfaction in the regression models, so as to establish the unique contribution of balance.

¹ Sheldon and Hoon (2006) also used this sample to report on the relation of need satisfaction to subjective well-being (SWB). However, they had very different theoretical purposes; did not examine the balance issue, only the amount issue; and used a different measure of need satisfaction than the one reported herein.

Table 1
Means, Standard Deviations, and Intercorrelations of Study Variables: Study 1

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
Need								
1. Autonomy	5.56	0.98	—					
2. Competence	5.40	1.08	.67	—				
3. Relatedness	5.81	1.06	.51	.54	—			
4. Balance	6.89	1.72	.26	.37	.12	—		
Well-being								
5. SWB	0.00	2.22	.55	.60	.51	.29	—	
6. Happiness	8.74	2.81	.40	.44	.43	.30	.68	—

Note. All correlations were significant at the $p < .05$ level or greater. SWB = subjective well-being.

Primary Analyses

Our most important hypothesis was that balance has a main effect on well-being that is independent of the total amount of need satisfaction. We conducted two hierarchical regression analyses, one using SWB and the other using happiness as the dependent variable (DV). In Step 1, the DV was regressed on the three measures of need satisfaction, with the balance score being entered in Step 2. Using SWB as the DV, autonomy, competence, and relatedness had standardized coefficients of .20, .35, and .21, respectively (all $ps < .01$); for Step 1, $F(3, 311) = 78.3, p < .001$. This replicates past research on the independent relations of the three needs to SWB (e.g., Reis et al., 2000; Sheldon et al., 2001). In Step 2, the balance score was a significant positive predictor ($\Delta R^2 = .01$), $F(1, 310) = 3.90, p < .05$. Together, the four measures accounted for 44% of the variance in SWB. Using happiness as the DV, autonomy, competence, and relatedness had standardized coefficients of .13, .22, and .24, respectively (all $ps < .05$); for Step 1, $F(3, 311) = 35.2, p < .001$. In Step 2, the balance score was a significant positive predictor ($\Delta R^2 = .028$), $F(1, 310) = 12.25, p < .001$. Together, the four measures accounted for 28% of the variance in happiness. Table 2 presents the results of

these analyses from Study 1 as well as from the other three studies.

To test for curvilinear relations, we entered the three squared product terms in a third step in both analyses. None of the three product terms reached significance in either analysis (all $ps > .14$). More important, in the SWB analysis, the impact of balance was essentially unchanged (going from $\beta = .09$ to $\beta = .08, p = .12$). In a similar manner, in the happiness analysis, the impact of balance was essentially unchanged (going from $\beta = .18$ to $\beta = .16, p = .004$). These results indicated that the effect of balance was not reducible to the influence of participants who were simply very high or very low in their satisfaction of one or more of the three needs.

In sum, Study 1 provided initial support for the hypothesis that balanced need satisfaction is beneficial for well-being and is independent of the level of need satisfaction. The balance effect emerged using two different measures of well-being and was not reducible to the main or curvilinear effects of the amounts of need satisfaction.

Study 2

In Study 2 we used a short-term longitudinal design to reexamine the models tested in Study 1. As mentioned in the introduction, Sheldon and Elliot (1999), as well as Reis et al. (2000), showed that the satisfaction of autonomy, competence, and relatedness over time predicted positive change in global well-being, which is consistent with bottom-up models of well-being that focus on the accumulation of small positive experiences over time (Diener, 1994). These findings suggest that need satisfaction is not only a stable personality disposition that can predict stable components of well-being; levels of need satisfaction also vary over time within individuals, producing corresponding fluctuations in well-being (Lyubomirsky, Sheldon, & Schkade, 2005). Thus, we examined whether the balance of need satisfaction can also influence short-term variations in well-being.

Specifically, we assessed well-being both at the beginning and at the end of a college semester and attempted to predict changes in well-being during that period. Our hypotheses were again two-

Table 2
Results of Regressions Used to Test the Primary Hypotheses: Studies 1–4

Study & step	Dependent measure							
	SWB		Happiness		Oppositional–defiant		Impulsive	
	ΔR^2	<i>p</i>	ΔR^2	<i>p</i>	ΔR^2	<i>p</i>	ΔR^2	<i>p</i>
Study 1								
Step 1	.45	< .01	.25	< .01				
Step 2	.01	< .05	.03	< .01				
Study 2								
Step 1	.51	< .01						
Step 2	.02	< .05						
Study 3								
Step 1	.43	< .01						
Step 2	.01	< .01						
Study 4								
Step 1					.31	< .01	.25	< .01
Step 2					.03	< .05	.03	< .05

Note. In Step 1, autonomy, competence, and relatedness were entered; in Step 2, the balance score was entered. In Study 2, Time 1 subjective well-being (SWB) was also entered in Step 1.

fold. First, we sought to replicate past longitudinal research linking need satisfaction to enhanced well-being (Reis et al., 2000; Sheldon & Elliot, 1999). Second, we sought to demonstrate that balance is facilitative of positive changes in well-being over and above the main effects of need satisfaction. Conceptually, demonstrating this relation using both between-subjects (Study 1) and within-subjects (Study 2) designs would provide strong support for the importance and generalizability of the balance hypothesis (e.g., see Reis et al., 2000; Sheldon et al., 1996). Also, such a longitudinal finding would suggest that trying to alter the balance of need satisfaction in people's lives may be a useful strategy for enhancing their well-being.

There was an additional new feature of Study 2. Specifically, we measured and controlled for neuroticism, which refers to the tendency to experience negative emotional extremes and volatility (Costa & McCrae, 1987). We did this because it is incumbent upon researchers to show that the effects of new personality constructs are not reducible to the effects of known constructs (Fortunato & Goldblatt, 2002), and relevant constructs derived from the Big Five model of personality have become the standard for this endeavor (Mroczek, Spiro, Aldwin, & Ozer, 1993). We examined neuroticism in particular because it is associated with inconsistent or variable responding (Robinson & Tamir, 2005). Because either characteristic might potentially generate and explain the (im)balance finding, showing that balance remains a significant predictor of well-being even after controlling for individual differences in neuroticism would support the incremental validity of the new construct.

Method

Participants and Procedure

Participants were 145 students (78% women) at the University of Missouri who participated in a 1-year study of goals, adjustment, and well-being.² The mean age of the participants was 18 years, with a range from 18 to 24. The majority of the sample identified themselves as Caucasian (90%), and the rest of the sample was composed of African American (8%) and other (2%). The data herein reported were collected during and just after the first semester. We assessed participants' well-being and neuroticism at a laboratory session at the beginning of the semester. At four times during the semester, we mailed the participants questionnaires that assessed their current need satisfaction. Near the end of the semester, we sent participants a questionnaire that again assessed their well-being.

Measures

Well-being. As in Study 1, we used the PANAS (Watson et al., 1988) and Satisfaction With Life Scale (Diener et al., 1985) to assess participants' positive affect, negative affect, and life satisfaction, using the same response scales. We administered the measures at both the beginning and the end of the semester, and we computed two aggregate indices of SWB by summing the relevant positive affect and life satisfaction scores and subtracting the relevant negative affect score. The reliabilities for this measure at Time 1 and Time 2 were $\alpha = .89$ and $.90$, respectively.

Need satisfaction. We used three items to assess autonomy (e.g., "Feeling choiceful and self-expressive in my everyday behavior"), three to assess competence (e.g., "Feeling competent and effective in my everyday behavior"), and three to assess relatedness (e.g., "Feeling related and connected to those who are important to me"). At four different times during the semester, participants rated their experience of each need during the previous 3 weeks, using a 7-point Likert-type scale, ranging from 1 (*not at all*) to 7 (*very much*). We computed semester autonomy, competence,

and relatedness need satisfaction scores by averaging these measures across the four assessments ($\alpha s = .74, .79$, and $.68$, respectively). We computed the balance score for the semester in the same way as in Study 1, by first creating three difference scores, then summing and reversing the absolute values of the three differences. Presumably, because of the greater averaging involved in Study 2 relative to Study 1, the balance score ranged from 0 to 4 in Study 2, rather than from 0 to 9 as in Study 1.

Neuroticism. We used the Neuroticism Scale from the NEO Five Factor Inventory (Costa & McCrae, 1989) to assess participants' neuroticism (12 items; e.g., "I feel inferior to others"). Responses were made on a 5-point Likert-type scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability for this measure was $\alpha = .86$.

Results and Discussion

Preliminary Analyses

Table 3 presents the means, standard deviations, and intercorrelations of the three measures of need satisfaction, the two measures of well-being, and the balance score. As in Study 1, the three measures of need satisfaction and the balance score were positively correlated with the well-being measures. Also notable was that semester-long balance was positively correlated with final SWB but not with initial SWB, consistent with our dynamic change perspective.

Primary Analyses

Again, our primary hypothesis was that balance has a main effect on changes in well-being that is independent of the total amount of need satisfaction. We conducted a hierarchical regression analysis in which final SWB (the DV) was regressed onto initial SWB and the three need satisfaction scores in Step 1 and then onto balance in Step 2. In Step 1, $F(4, 140) = 36.22, p < .01$, autonomy, competence, and relatedness had standardized coefficients of $.17$ ($p = .11$), $.21$ ($p = .06$), and $.08$ ($p = .28$), respectively, and the test-retest coefficient for initial SWB was $.38$ ($p < .01$). Notably, although the needs did not reach significance in the change analyses, each was significantly correlated with SWB at the zero-order level. In Step 2, the balance score was also a significant and positive predictor ($\Delta R^2 = .018$), $F(1, 139) = 5.22, p = .024$. Together, the five measures accounted for 53% of the variance (see Table 2 for a summary of the results).

To test for curvilinear relations, we entered the three squared product terms in Step 3. These three product terms did not reach significance (all $p s > .34$), and balance remained significant ($\beta = .15, p = .024$). This underscores the importance of balance even after the influence of extreme scores is removed.

In a second control analysis, we entered neuroticism in Step 1 along with initial SWB and the three need satisfaction scores before entering the balance score in Step 2. In Step 1, neuroticism had a marginally significant negative association with change in SWB ($\beta = -.14, p = .075$); more important, balance remained significant in Step 2 ($\Delta R^2 = .018, p = .023$). This finding indicates that balance is independent of the relations of neuroticism (or trait negative affectivity).

² Sheldon and Hoon (2006) also used this sample to report on the relation of need satisfaction to longitudinal SWB, but again, they had a very different theoretical purpose, and they did not examine the balance issue, only the amount issue.

Table 3
Means, Standard Deviations, and Intercorrelations of Study Variables: Study 2

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
Need								
1. Autonomy	5.44	0.92	—					
2. Competence	5.32	0.98	.82	—				
3. Relatedness	5.45	0.91	.56	.62	—			
4. Balance	3.58	0.69	.01	.19	.30	—		
Well-being								
5. Initial SWB	0.05	2.35	.55	.53	.48	.07	—	
6. Final SWB	-0.01	2.40	.60	.60	.49	.22	.63	—

Note. All correlations significant at the $p < .01$ level or greater, except those between balance and initial subjective well-being (SWB) and between balance and autonomy need satisfaction ($ps > .10$).

In sum, Study 2 replicated the primary findings of Study 1 using a short-term longitudinal analysis of changes in SWB. We again demonstrated that the relation of balance to SWB was independent of both the linear and the curvilinear relations of need satisfaction; moreover, in Study 2 we found that this relation was robust when controlling for neuroticism, thus indicating that balance is different than (the absence of) trait negative affectivity or emotional volatility. Finally, the fact that balanced need satisfaction predicted positive changes in well-being over a 3-month period suggests that trying to change the overall balance of autonomy, competence, and relatedness need satisfaction in one's life may be a defensible happiness-increasing strategy.

Study 3

Whereas in Study 1 we examined global satisfaction and well-being at one point in time and in Study 2 we examined changes in well-being from the beginning to the end of a 3-month period, in Study 3 we examined within-subject variations in need satisfaction and well-being over multiple, shorter periods. Specifically, in Study 3 we examined the balance hypothesis using a daily diary methodology. Participants rated their need satisfaction and well-being experienced during the last 24 hours at eight different times during a college semester. In this study, we sought (a) to replicate previous work by Reis et al. (2000) that showed that satisfaction of the three needs at the day-to-day level predicted daily fluctuations in well-being and (b) to demonstrate that balance would also predict greater well-being at the day-to-day level. Such findings would support our assumption that there is a dynamic process at work and suggest that trying to alter the balance of need satisfaction may be useful for enhancing well-being.

Method

Participants and Procedure

Participants were 91 students (79% women) at the University of Rochester who participated as part of an extra credit opportunity.³ The mean age of the participants was 19 years, with a range from 17 to 35. The majority of the sample identified themselves as Caucasian (62%), and the rest of the sample was composed of African American (16%), Hispanic (5%), Asian (12%), and other (5%). At eight points during the semester, approximately once every 10 days, participants rated their satisfaction of autonomy, competence, and relatedness, as well as their well-being, during the pre-

vious 24 hr (Reis et al., 2000; Sheldon et al., 1996). Participants were included in the final dataset only if they had at least five reports; thus, 8 of the participants were omitted from analyses, leaving a total sample of 83. The majority of participants (64%) had 8 reports, and there were 609 reports in the day-level sample.

Measures

Well-being. We used items developed by Emmons (1991) to assess participants' daily positive (4 items; e.g., "happy") and negative (5 items; e.g., "frustrated") mood, and we used items developed by Brunstein (1993) to assess participants' daily life satisfaction (2 items; e.g., "Today, I am completely satisfied with my life"). For mood, responses were made on a 7-point Likert-type scale, ranging from 1 (*not at all*) to 7 (*very much*), and for life satisfaction the scale ranged from 1 (*completely disagree*) to 7 (*completely agree*). The reliability for each measure was as follows: positive mood $\alpha = .89$, negative mood $\alpha = .82$, life satisfaction $\alpha = .78$. As in Study 1, we computed a daily SWB score by standardizing the measures and summing positive mood and life satisfaction and subtracting negative mood (Diener & Lucas, 1999; Sheldon & Elliot, 1999). The reliability for this composite was $\alpha = .89$.

Need satisfaction. In each of the eight questionnaires, participants responded to three items to assess autonomy (e.g., "Feeling generally autonomous and choiceful in what I do"), three to assess competence (e.g., "Feeling generally competent and able in what I attempt"), and three to assess relatedness (e.g., "Feeling generally related and connected to the people I spend time with"). Responses were made on a 7-point Likert-type scale, ranging from 1 (*very little*) to 7 (*very much*). We created the daily balance score in the same way as in the previous studies: by summing and reverse scoring the absolute differences among the three needs. This score represents the extent to which participants experienced commensurate amounts of satisfaction on particular days. In Study 3, the balance score ranged from 0 to 12, rather than from 0 to 9 as in Study 1 or from 0 to 4 as in Study 2. This range likely reflects the fact that satisfaction was assessed on a large number of single days with no averaging, allowing for more variability in satisfaction.

Results and Discussion

Preliminary Analyses

Table 4 presents the means, standard deviations, and intercorrelations of the three measures of need satisfaction, the measure of daily well-being, and the balance score. In general, the need satisfaction measures were positively correlated with balance and with SWB.

Primary Analyses

We used SAS proc mixed to test our primary hypotheses at the day level (Singer, 2002). This software accounted for the nesting of multiple diary reports within participants and focused the analysis on within-subjects variation around the participants' own mean (for the reader's information, proc mixed is similar to HLM and other multilevel modeling software). Specifically, we pre-

³This sample was also used in Sheldon and Elliot (1999) to test hypotheses concerning goals, need satisfaction, and well-being. However, in contrast to the present study, Sheldon and Elliot only reported aggregated diary data that was (a) averaged over the eight reports, with no within-subjects results; (b) focused on semester well-being, not daily well-being; and (c) used different items from the daily questionnaires to assess need satisfaction. Thus, none of the measures in the current study have been reported before.

Table 4
Means, Standard Deviations, and Intercorrelations of Study
Variables: Study 3

Measure	<i>M</i>	<i>SD</i>	1	2	3	4	5
Need							
1. Daily autonomy	4.86	1.39	—				
2. Daily competence	4.89	1.25	.52	—			
3. Daily relatedness	5.31	1.20	.29	.26	—		
4. Daily balance	8.88	2.37	.45	.35	-.05	—	
Well-being							
5. Daily SWB	0.00	2.48	.49	.61	.34	.33	—

Note. All correlations significant at the $p < .01$ level or greater, except that between relatedness need satisfaction and balance. SWB = subjective well-being.

dicted daily SWB from both the daily satisfaction scores and the daily balance score, while controlling for participant-level mean differences on the variables of interest. We present the nonstandardized coefficients below.

As expected, the intercept term representing the sample mean was significantly different from zero ($B = 4.85, p < .01$). In addition, autonomy, competence, and relatedness each had significant relations to daily SWB (B s = .39, 1.07, and .55, all $ps < .01$), indicating that day-level fluctuations in all three of the needs made independent contributions. Most important for the primary study hypothesis, daily balance also had a significant positive relation to daily SWB ($B = .14, p < .01$; see Table 2 for a summary of the results).

To test for curvilinear relations, we reconducted the analysis, this time also entering three squared product terms. None of the three product terms reached significance (all $ps > .28$), and balance remained significant ($p < .01$). This finding again indicates that balance remains important even after extreme scores are considered.

In sum, Study 3 replicated the primary findings of Studies 1 and 2, using a design that focused on predicting within-subjects fluctuations in SWB around the participants' own means. Once again, the association between balanced need satisfaction and SWB was independent of both the linear and the curvilinear effects of the amount of need satisfaction. These results go beyond the 3-month-long design of Study 2, suggesting that the balance of need satisfaction varies even in the short-term and has predictable effects on daily well-being.

Study 4

A potential limitation of the previous studies was that all data were collected from the same source, namely the participants. Thus, it is possible that the observed relations were obtained because of the common (self-report) method variance shared between the measures of need satisfaction and well-being. It was therefore important to assess whether the balance hypothesis was supported when the data came from two different respondents. Thus, in Study 4 we examined the balance hypothesis using a non-self-report dependent variable.

Specifically, in Study 4 participants reported their experiences of support for their psychological need satisfaction that were provided to them by their mothers. In addition, mothers reported on their children's general engagement in disruptive behaviors

(i.e., impulsive and oppositional-defiant behaviors). Because psychological needs are defined as necessary for a variety of adjustment and psychological health outcomes (Deci & Ryan, 2000), we assumed that need satisfaction and balance should affect both intrapsychic and behavioral indices of mental health. Thus, we hypothesized that positive behavioral conduct would be predicted both by the total amount of need satisfaction and by the balance of need satisfaction. In other words, participants who receive inadequate and/or imbalanced need satisfaction from their mothers should evidence more signs of disruptive or defiant behaviors.

Method

Participants and Procedure

Participants were 200 students (50% women) at the University of Rochester who participated in the study for extra course credit. The mean age of the participants was 19 years, with a range from 17 to 34. The majority of the sample identified themselves as Caucasian (79%), and the rest of the sample was composed of African American (4.5%), Hispanic (5%), Asian (8.5%), and other (3%). A majority of the sample lived with their mother while school was not in session (90.5%), and of those, 99% lived with their biological mother.

Participants completed a battery of questionnaires and subsequently addressed an envelope to their mother that contained the measure of their child's behavioral conduct. Mothers were assured that their responses would remain confidential and that their voluntary participation in the study would in no way affect their own or their child's standing at the university. Eighty-one percent of participants' mothers returned completed questionnaires, yielding a total of 162 responses from mothers. Mothers' and participants' data were matched using a randomly assigned 4-digit code number that was used on both sets of data.

Measures

Behavioral conduct. We used the Disruptive Behavior Disorder Scale (Pelham, Gnagy, Greenslade, & Milich, 1992) to assess mothers' perceptions of their children's engagement in oppositional-defiant (8 items; e.g., "Often argues with adults") and impulsive (9 items; e.g., "Often talks excessively") behaviors. Responses were made on a 4-point Likert-type scale, ranging from 1 (*not at all*) to 4 (*very much*). The reliability for each subscale was as follows: oppositional-defiant behaviors $\alpha = .88$ and impulsive behaviors $\alpha = .80$.

Need satisfaction. We used a modified Need Satisfaction Scale (LaGuardia et al., 2000) to assess participants' perceptions of their mothers' support for autonomy (2 items; e.g., "When I am with my mother, I have a say in what happens and I can voice my opinions"), competence (2 items; e.g., "When I am with my mother, I feel very capable and effective"), and relatedness (2 items; e.g., "When I am with my mother, I feel a lot of closeness and intimacy"). Responses were made on a 7-point Likert-type scale, ranging from 1 (*not at all true*) to 7 (*very true*). The reliability for each subscale was as follows: autonomy $\alpha = .73$, competence $\alpha = .75$, and relatedness $\alpha = .74$. The balance score was created in the same way as in the previous studies, by summing and reverse scoring the absolute differences among the three needs. As in Study 1, the balance score ranged from 0 to 9 in Study 4.

Results and Discussion

Preliminary Analyses

Independent samples t tests with Bonferroni protection revealed no significant differences in participants' reports of support for autonomy, competence, and relatedness between those participants

whose mothers returned the measure of behavioral conduct and those whose mothers did not.

Table 5 presents the means, standard deviations, and intercorrelations of the three measures of need satisfaction, the balance score, and the measures of behavioral conduct. Consistent with Studies 1, 2, and 3, the need satisfaction measures were positively correlated with balance. Also, as would be expected from the results of the three previous studies, the measures of need satisfaction were negatively correlated with disruptive behaviors. In addition, balance was also negatively correlated with disruptive behaviors.

Primary Analyses

Our primary hypothesis was that balance, in addition to the three psychological needs, would negatively relate to mothers' reports of oppositional-defiant and impulsive behaviors. We conducted two hierarchical regression analyses, one using oppositional-defiant behaviors and the other using impulsive behaviors as the DV. In Step 1, we regressed the DV onto the three measures of need satisfaction; we added the balance score in Step 2; and we added the curvilinear terms in Step 3.

Using oppositional-defiant behaviors as the DV, autonomy, competence, and relatedness had standardized coefficients of $-.25$ ($p < .05$), $-.26$ ($p < .05$), and $-.12$ (*ns*); for Step 1, $F(3, 157) = 23.77$, $p < .001$. In Step 2, the balance score was also a significant negative predictor ($\Delta R^2 = .03$), $F(1, 156) = 5.34$, $p < .05$. Together, the four measures accounted for 34% of the variance in oppositional-defiant behaviors. In Step 3, none of the curvilinear terms reached significance (all $ps > .08$).

Using impulsive behaviors as the DV, autonomy, competence, and relatedness had standardized coefficients of $-.23$ ($p < .05$), $-.34$ ($p < .01$), and $.05$ (*ns*); for Step 1, $F(3, 157) = 17.71$, $p < .001$. In Step 2, the balance score was also a significant negative predictor ($\Delta R^2 = .03$), $F(1, 156) = 6.45$, $p < .05$ (see Table 2 for a summary of the results). Together, the four measures accounted for 28% of the variance in impulsive behaviors. In Step 3, none of the curvilinear terms reached significance (all $ps > .10$).

In sum, Study 4 replicated the earlier studies and also extended them by (a) focusing on a behavioral, as opposed to a well-being, outcome; (b) measuring the outcome (i.e., mother-rated disruptive behavior) independently of the need satisfaction predictors, thus eliminating self-report method variance as an alternate explanation of the findings; and (c) extending the balanced need satisfaction effect to the social realm (i.e., how mother treats me), going beyond the prior focus upon private experience alone. Thus, Study

4 strengthens the case for the idea that balanced need satisfaction is an important and substantive predictor of psychological health and adjustment.

General Discussion

The purpose of the present research was to attempt to contribute new information to the evolving synthesis that concerns the nature and implications of psychological need satisfaction. This article began with a discussion of three perennial questions about psychological needs: whether the needs vary in their importance across individuals, whether need satisfaction necessarily follows from motivated behavior, and whether the level of need satisfaction predicts psychological health. SDT posits that all people require certain experiential inputs (*viz.*, autonomy, competence, and relatedness) for optimal health and functioning, although this view is in contrast with theories that conceptualize psychological needs as acquired individual differences that do not necessarily promote well-being when attained. Many recent findings support the SDT position and suggest that the psychological needs have considerable explanatory power for understanding both the social and the personality factors that enable psychological health (e.g., Deci & Ryan, 2000; Sheldon, 2004). The present research confirmed these past findings and, moreover, identified an important construct that has not been examined within SDT—the balance in satisfaction of the psychological needs.

Through four studies that used a diverse set of methodologies and measures, we examined the hypothesis that balanced need satisfaction contributes to psychological health over and above the total amount of need satisfaction. Consistent with past research, our findings indicate that the people who are happiest in life are those who endorse their actions, feel effective, and feel connected to close others, thereby satisfying their needs for autonomy, competence, and relatedness. More important, we found that the *balance* of need satisfaction, in addition to the total amount, is also important for psychological health. Thus, regarding the example described in the introduction, our data suggest that the stay-at-home mother may experience higher well-being relative to the entrepreneur because her level of satisfaction is more balanced, even though both had the same overall amount of need satisfaction.

Admittedly, the effect sizes for the positive impact of balance on well-being were modest (ranging in absolute value from .09 to .24), whereas the three needs themselves had larger effects. However, the balance effect emerged consistently across diverse methodologies and designs (i.e., cross-sectional, prospective, daily diary, and multiple reporter) and also emerged consistently across

Table 5
Means, Standard Deviations, and Intercorrelations of Study Variables: Study 4

Variable	<i>M</i>	<i>SD</i>	1	2	3	4	5	6
Need measures								
1. Autonomy	5.46	1.55	—					
2. Competence	5.83	1.44	.76	—				
3. Relatedness	6.04	1.19	.57	.64	—			
4. Balance	9.53	2.09	.69	.62	.45	—		
Disruptive behaviors								
5. Oppositional-defiant	1.49	0.55	-.52	-.53	-.42	-.49	—	
6. Impulsive	1.34	0.45	-.46	-.48	-.29	-.46	.76	—

Note. All correlations significant at the $p < .001$ level.

multiple measures of well-being and adjustment. In addition, the hypothesized relation was obtained when multiple alternative factors were controlled, including the total amount of need satisfaction, the curvilinear effects of need satisfaction, and neuroticism. The robustness of the findings controlling for curvilinear effects of satisfaction, in particular, suggests that balance is important for those at both the bottom and at the top of the scale, rather than becoming important only beyond some initial threshold of satisfaction.⁴

As discussed in the introduction, ours is not the first study to find a connection between personal variability and ill-being. For example, self-concept differentiation (Donahue et al., 1993; Sheldon, Ryan, Rawsthorne, & Ilardi, 1997), unstable self-esteem (Paradise & Kernis, 2002), high self-other discrepancies (Campbell et al., 2003), and overly differentiated goals (Sheldon & Emmons, 1995) have also been shown to carry risks. The present research may be viewed as adding to this general tradition, in which statistical measures of system properties are shown to provide information that goes beyond the mere content and extremity of responses (Block, 1961; Campbell et al., 2003). However, ours is the first study to demonstrate that within-person variation across important types of experience (i.e., psychological needs) can have negative effects, going beyond past research that has focused only on within-person variation across important self-concepts.

Because the focus of the present research was on demonstrating the importance of balanced need satisfaction for psychological health, and not on identifying possible mediators of this effect, we cannot definitively state which mechanisms account for our findings. Some possible answers are suggested, however, by the burgeoning life balance literature, particularly within the area of industrial-organizational psychology (Greenblatt, 2002). This research focuses specifically on imbalances between work and family life that, over time, can exact a toll on workers' emotional and psychosocial well-being. Considerable research now supports this idea, and thus life balance workshops and intervention programs have become near-standard in many corporate settings (Green & Skinner, 2005). Theoretical explanations of the negative effects of imbalance for well-being have focused on the stress, strain, burn-out, and role conflict occasioned by such a lifestyle (Crooker, Smith, & Tabak, 2002; Greenblatt, 2002; Russell, 2005).

We propose that imbalanced need satisfaction reflects a similar set of dynamics, as in the earlier example of the overworked entrepreneur. In other words, such discrepancies may lead to chronic stress and role conflict (Donahue et al., 1993), which in turn detract from well-being via mechanisms that are distinct from need satisfaction itself. Thus, although the entrepreneur experiences the same total amount of need satisfaction as the stay-at-home mother, his well-being may suffer because of the stresses and conflicts occasioned by his mode of deriving satisfaction. Another possible explanation for the imbalance effect is suggested by Vallerand and colleagues' recent work showing that so-called harmonious passions are more salubrious than so-called obsessive passions (Seguin-Levesque et al., 2003; Vallerand et al., 2003). Although people truly want to engage in obsessive passions (e.g., road-biking, Web-surfing, gambling), such activities can become addictions that create conflict and imbalance in people's lives. Of course, future research will be needed to test the hypotheses that stress, strain, role conflict, or obsessive tendencies account for the imbalance effect.

An intriguing question that also warrants future empirical consideration concerns whether, and how, well-being is affected by an increase in the total amount of need satisfaction that also results in a more imbalanced need profile. We propose that when a person changes to a more imbalanced state, he or she begins to accrue life stresses and role conflicts that eventually, if not immediately, detract from well-being. Thus, a person who shifts from a 4-4-4 profile of need satisfaction to a more imbalanced 5-4-4 profile may experience heightened well-being in the short-term, but this increase in well-being is likely to be leavened in the long-term because of the added stress that is associated with imbalanced need satisfaction. Obviously, it will be important for future well-being research to investigate both the short-term and long-term effects of changing one's need satisfaction profile.

The present research has important implications for the debate concerning eudaemonic and hedonic approaches to well-being (Ryan & Deci, 2000). Consistent with the eudaemonic perspective, our research suggests that trying to maximize certain needs while ignoring others is likely to be detrimental for well-being. Instead, psychological health is supported through the development of a multifaceted personality and through the commensurate satisfaction of all three psychological needs. This brings to mind Aristotle's concept of the golden mean from his *Nicomachean Ethics*. The golden mean is the path of "not too little, not too much, but just enough"; when people seek the golden mean, they learn to live in harmony and order with themselves.

Future intervention-based research might seek to enhance people's well-being by helping them to alter the balance of satisfaction of their psychological needs. For example, after an initial assessment, customized interventions might focus participants on making life changes to boost needs that are inadequately satisfied, while ignoring needs that are already adequately satisfied. In this way, participants' well-being might benefit the most because their aggregate level of need satisfaction is raised at the same time that variability is reduced. Specific interventions for boosting need satisfaction might include relationship and interpersonal therapies to facilitate the satisfaction of relatedness; skills training and performance therapies to increase the satisfaction of competence; and motivational interviewing and insight therapy to bolster the satisfaction of autonomy (Markland, Ryan, Tobin, & Rollnick, 2005; Sheldon, Williams, & Joiner, 2003).

Limitations and Conclusion

There were several limitations to the present research. First, all the participants were from the United States and were rather homogenous in age and background. Thus, the replicability of these results to people of different ages and in different cultures must be established. Second, we do not yet know which factors

⁴ Although the curvilinear analyses generally address the threshold issue, to examine it more rigorously we excluded those in the bottom 10% of the sample on overall need satisfaction in each of the four studies, and the results were essentially unchanged. In addition, we examined the interaction between balance and the three needs (low vs. high) in each study. Although some interactions emerged, they were not obtained at a level above chance and they did not form a clear pattern. Thus, there is no evidence that balance matters less for those who are low in need satisfaction. Indeed, balance may matter more for such people because need deprivation is more salient for them.

mediate or account for the balance effects. Does balanced need satisfaction influence well-being by reducing stress, by enhancing personal resources, and/or by buffering against momentary failures? These process questions await future research attention. Third, our primary finding remains to be demonstrated within laboratory settings that experimentally manipulate the three needs. Such context-focused research would go beyond the maternal need provision data reported in Study 4. Fourth, the longitudinal findings of Studies 2 and 3 remain to be replicated over longer periods of time. Might shifting the balance of satisfaction in one's life promote positive changes that last over the long term? Fifth, it remains to be demonstrated whether the balance effect generalizes to other theories of needs and motives. We believe it should apply primarily to theories that focus on needs as universally required experiences for well-being (e.g., Deci & Ryan, 2000), rather than those that view needs as acquired individual differences in behavioral motives (e.g., McClelland, 1985). For now, however, it appears that it's not just the amount that counts—balance also matters.

References

- Adams, G. A., King, L. A., & King, D. W. (1996). Relationship of job and family involvement, family social support, and work-family conflict with job and life satisfaction. *Journal of Applied Psychology, 81*, 411–420.
- Arye, S. (1992). Antecedents and outcomes of work-family conflict among married professional women: Evidence from Singapore. *Human Relations, 45*, 813–837.
- Baard, P. P., Deci, E. L., & Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology, 34*, 2045–2068.
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117*, 497–529.
- Block, J. (1961). Ego-identity, role variability, and adjustment. *Journal of Consulting and Clinical Psychology, 25*, 392–397.
- Brewer, M. B. (1991). The social self: On being the same and different at the same time. *Personality and Social Psychology Bulletin, 17*, 475–482.
- Brunstein, J. (1993). Personal goals and subjective well-being: A longitudinal study. *Journal of Personality and Social Psychology, 65*, 1061–1070.
- Buss, D. M. (2000). The evolution of happiness. *American Psychologist, 55*, 15–23.
- Campbell, J. D., Assanand, S., & Di Paula, A. (2003). The structure of the self-concept and its relation to psychological adjustment. *Journal of Personality, 71*, 115–140.
- Chapman, N. J., Ingersoll-Dayton, B., & Neal, M. B. (1994). Balancing the multiple roles of work and caregiving for children, adults, and elders. In G. W. Keita & J. J. Hurrell (Eds.), *Job stress in a changing workforce: Investigating gender, diversity, and family issues* (pp. 283–300). Washington, DC: American Psychological Association.
- Costa, P. T., Jr., & McCrae, R. R. (1987). Neuroticism, somatic complaints, and disease: Is bark worse than bite? *Journal of Personality, 55*, 299–316.
- Costa, P. T., Jr., & McCrae, R. R. (1989). *NEO-PI/FFI manual Suppl.* Odessa, FL: Psychological Assessment Resources.
- Crooker, K. J., Smith, F. L., & Tabak, F. (2002). Creating work-life balance: A model of pluralism across life domains. *Human Resource Development Review, 1*, 387–419.
- deCharms, R. (1968). *Personal causation*. New York: Academic Press.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum Press.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*, 227–268.
- Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc country. *Personality and Social Psychology Bulletin, 27*, 930–942.
- Diener, E. (1994). Assessing subjective well-being: Progress and opportunities. *Social Indicators Research, 31*, 103–157.
- Diener, E., Emmons, R., Larsen, R., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 47*, 1105–1117.
- Diener, E., & Lucas, R. E. (1999). Personality and subjective well-being. In D. Kahneman, E. Diener, & N. Schwartz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 213–229). New York: Sage.
- Donahue, E. M., Robins, R. W., Roberts, B. W., & John, O. P. (1993). The divided self: Concurrent and longitudinal effects of psychological adjustment and social roles on self-concept differentiation. *Journal of Personality and Social Psychology, 64*, 834–846.
- Emmons, R. (1991). Personal strivings, daily life events, and psychological and physical well-being. *Journal of Personality, 59*, 453–472.
- Filak, V., & Sheldon, K. M. (2003). Student psychological need satisfaction and college teacher-course evaluations. *Educational Psychology, 23*, 235–247.
- Fortunato, V. J., & Goldblatt, A. M. (2002). Construct validation of revised Strain-Free Negative Affectivity Scale. *Educational and Psychological Measurement, 62*, 45–63.
- Gagné, M., Ryan, R. M., & Bargmann, K. (2003). Autonomy support and need satisfaction in the motivation and well-being of gymnasts. *Journal of Applied Sport Psychology, 15*, 372–390.
- Grant-Vallone, E. J., & Donaldson, S. I. (2001). Consequences of work-family conflict on employee well-being over time. *Work & Stress, 15*, 214–226.
- Green, P., & Skinner, D. (2005). Does time management training work? An evaluation. *International Journal of Training and Development, 9*, 124–139.
- Greenblatt, E. (2002). Work/life balance: Wisdom or whining. *Organizational Dynamics, 31*, 177–193.
- Ilardi, B. C., Leone, D., Kasser, R., & Ryan, R. M. (1993). Employee and supervisor ratings of motivation: Main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *Journal of Applied Social Psychology, 23*, 1789–1805.
- Jung, C. (1971). *The portable Jung*. New York: Viking Press.
- Kasser, V. M., & Ryan, R. M. (1999). The relation of psychological needs for autonomy and relatedness to health, vitality, well-being and mortality in a nursing home. *Journal of Applied Social Psychology, 29*, 935–954.
- LaGuardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-person variation in security of attachment: A self-determination theory perspective on attachment, need fulfillment, and well-being. *Journal of Personality and Social Psychology, 79*, 367–384.
- Linville, P. (1987). Self-complexity as a cognitive buffer against stress-related illness and depression. *Journal of Personality and Social Psychology, 52*, 663–676.
- Lyubomirsky, S., & Lepper, H. S. (1999). A measure of subjective happiness: Preliminary reliability and construct validation. *Social Indicators Research, 46*, 137–155.
- Lyubomirsky, S., Sheldon, K., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology, 9*, 111–131.
- Markland, D., Ryan, R. M., Tobin, V. J., & Rollnick, S. (2005). Motivational interviewing and self-determination theory. *Journal of Social and Clinical Psychology, 24*, 811–831.
- Maslow, A. (1971). *The farther reaches of human nature*. New York: Viking Press.
- McAdams, D. P. (2001). *The person: An integrated introduction to personality psychology*. Fort Worth, TX: Harcourt.

- McClelland, D. (1985). *Human motivation*. Glenview, IL: Scott Foresman.
- McDougall, W. (1908). *Introduction to social psychology*. London: Methuen.
- Mroczek, D. K., Spiro, A., Aldwin, C. M., & Ozer, D. J. (1993). Construct validation of optimism and pessimism in older men: Findings from the normative aging study. *Health Psychology, 12*, 406–409.
- Murray, H. (1938). *Explorations in personality*. New York: Oxford University Press.
- Niemiec, C. P., Ryan, R. M., & Deci, E. L. (2006). *The path taken: Consequences of attaining intrinsic and extrinsic aspirations in post-college life*. Manuscript submitted for publication.
- Niemiec, C. P., Lynch, M. F., Vansteenkiste, M., Bernstein, J., Deci, E. L., & Ryan, R. M. (in press). The antecedents and consequences of autonomous self-regulation for college: A self-determination theory perspective on socialization. *Journal of Adolescence*.
- Noor, N. M. (2004). Work-family conflict, work- and family-role salience, and women's well-being. *The Journal of Social Psychology, 144*, 389–405.
- Paradise, A. W., & Kernis, M. H. (2002). Self-esteem and psychological well-being: Implications of fragile self-esteem. *Journal of Social and Clinical Psychology, 21*, 345–361.
- Pelham, W. E., Gnagy, E. M., Greenslade, K. E., & Milich, R. (1992). Teacher ratings of DSM-III-R symptoms for the disruptive behavior disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 32*, 210–218.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, R., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin, 26*, 419–435.
- Rice, R. W., Frone, M. R., & McFarlin, D. B. (1992). Work-non-work conflict and the perceived quality of life. *Journal of Organizational Behavior, 13*, 155–168.
- Robinson, M. D., & Tamir, M. (2005). Neuroticism as mental noise: A relation between neuroticism and reaction time standard deviations. *Journal of Personality and Social Psychology, 89*, 107–114.
- Russell, J. E. A. (2005). Work and life integration—Organizational, cultural, and individual perspectives. *Personnel Psychology, 58*, 1065–1069.
- Ryan, R. M. (1995). Psychological needs and the facilitation of integrative processes. *Journal of Personality, 63*, 397–427.
- Ryan, R. M., & Deci, E. L. (2000). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology, 52*, 141–166.
- Ryan, R. M., Sheldon, K. M., Kasser, T., & Deci, E. L. (1996). All goals are not created equal: An organismic perspective on the nature of goals and their regulation. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 7–26). New York: Guilford Press.
- Seguin-Levesque, C., Lalliberte, M. L. N., Pelletier, L. G., Blanchard, C., & Vallerand, R. (2003). Harmonious and obsessive passion for the Internet: Their associations with the couple's relationship. *Journal of Applied Social Psychology, 33*, 197–221.
- Sheldon, K. M. (2004). *Optimal human being: An integrated multilevel perspective*. Mahwah, NJ: Erlbaum.
- Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of Personality and Social Psychology, 76*, 482–497.
- Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What's satisfying about satisfying events? Comparing ten candidate psychological needs. *Journal of Personality and Social Psychology, 80*, 325–339.
- Sheldon, K. M., & Emmons, R. A. (1995). Comparing differentiation and integration within personal goal systems. *Personality and Individual Differences, 18*, 39–46.
- Sheldon, K. M., & Hoon, T. H. (2006). *The multiple determination of well-being: Independent effects of positive traits, needs, goals, selves, social supports, and cultural contexts*. Manuscript submitted for publication.
- Sheldon, K. M., & Kasser, T. (1998). Pursuing personal goals: Skills enable progress, but not all progress is beneficial. *Personality and Social Psychology Bulletin, 24*, 1319–1331.
- Sheldon, K. M., & Kasser, T. (2001). Getting older, getting better? Personal strivings and personality development across the life-course. *Developmental Psychology, 37*, 491–501.
- Sheldon, K. M., Ryan, R. M., Rawsthorne, L., & Ilardi, B. (1997). "True" self and "trait" self: Cross-role variation in the Big Five traits and its relations with authenticity and well-being. *Journal of Personality and Social Psychology, 73*, 1380–1393.
- Sheldon, K. M., Ryan, R. M., & Reis, H. R. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin, 22*, 1270–1279.
- Sheldon, K. M., Williams, G., & Joiner, T. (2003). *Self-determination theory in the clinic: Motivating physical and mental health*. Hartford, CT: Yale University Press.
- Singer, J. D. (2002). Fitting individual growth models using SAS proc mixed. In D. S. Moskowitz & S. L. Hershberger (Eds.), *Modeling intraindividual variability with repeated measures data: Methods and applications* (pp. 135–170). Mahwah, NJ: Erlbaum.
- Swann, W. B., Jr. (1990). To be adored or to be known? The interplay of self-enhancement and self-verification. In E. T. Higgins & R. M. Sorrentino (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 408–448). New York: Guilford Press.
- Vallerand, R. J., Blanchard, C., Mageau, G. A., Koestner, R., Ratelle, C., Leonard, M., et al. (2003). Les passions de l'ame: On obsessive and harmonious passion. *Journal of Personality and Social Psychology, 85*, 756–767.
- Vansteenkiste, M., Neyrinck, B., Niemiec, C. P., Soenens, B., de Witte, H., & Van den Broeck, A. (in press). On the relations among work value orientations, psychological need satisfaction, and job outcomes: A self-determination theory approach. *Journal of Occupational and Organizational Psychology*.
- Waterman, A. S. (1993). Two conceptions of happiness: Contrasts of personal expressiveness (eudaemonia) and hedonic enjoyment. *Journal of Personality and Social Psychology, 64*, 678–691.
- Watson, D., Tellegen, A., & Clark, L. (1988). Development and validation of brief measures of positive and negative affect: The PANAS Scales. *Journal of Personality and Social Psychology, 54*, 1063–1070.
- White, R. W. (1959). Motivation reconsidered: The concept of competence. *Psychological Review, 66*, 297–333.
- Williams, G. C., McGregor, H. A., Sharp, D., Levesque, C., Kouides, R. W., Ryan, R. M., & Deci, E. L. (2006). Testing a self-determination theory intervention for motivating tobacco cessation: Supporting autonomy and competence in a clinical trial. *Health Psychology, 25*, 91–101.
- Williams, G. C., McGregor, H. A., Zeldman, A., Freedman, Z. R., & Deci, E. L. (2004). Testing a self-determination theory process model for promoting glycemic control through diabetes self-management. *Health Psychology, 23*, 58–66.

Received February 2, 2005

Revision received March 13, 2006

Accepted March 14, 2006 ■