

# The Role of Need Fulfillment in Relationship Functioning and Well-Being: A Self-Determination Theory Perspective

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Self-determination theory posits 3 basic psychological needs: autonomy (feeling uncoerced in one's actions), competence (feeling capable), and relatedness (feeling connected to others). Optimal well-being results when these needs are satisfied, though this research has traditionally focused on individual well-being outcomes (e.g., E. L. Deci & R. M. Ryan, 2000). Three studies examined the role of need fulfillment in relationship functioning and well-being. Study 1 found that fulfillment of each need individually predicted both individual and relationship well-being, with relatedness being the strongest unique predictor of relationship outcomes. Study 2 found that both partners' need fulfillment uniquely predicted one's own relationship functioning and well-being. Finally, in Study 3, the authors used a diary recording procedure and tested a model in which the association between need fulfillment and relationship quality was mediated by relationship motivation. Those who experienced greater need fulfillment enjoyed better postdisagreement relationship quality primarily because of their tendency to have more intrinsic or autonomous reasons for being in their relationship.

*Keywords:* psychological needs, self-determination theory, relationships

Need theories are distinguishable by their perspective on the target of needs (i.e., physiological or psychological) and by their definition of needs (i.e., nutriments necessary for growth versus any motivating force). Hull's (1943) drive theory is one salient example of a *physiological need theory*. According to this perspective, people have a set of innate physiological needs including food, water, and sex. These physiological needs reflect tissue deficits, result in drive states, and must be met for the organism to remain physically healthy (Hull, 1943). Thus, drive theory identifies the target of the needs as physiological and defines the needs as necessary nutriments for optimal physiological growth and development. The perspective outlined by Murray (1938) has provided much of the basis for *psychological need theory*. In contrast to the Hullian tradition, which suggests that needs are innate, Murray's perspective on psychological needs suggests that

needs are acquired. According to Murray, a need is conceptualized as anything that moves an individual to action. Thus, Murray's list of needs is quite extensive and accommodates drives toward positive psychological development (e.g., self-actualization) as well as drives toward less adaptive functioning (e.g., greed). The self-determination theory (SDT; Deci & Ryan, 1985, 2000) perspective on needs lies somewhere between these two traditions. SDT has focused on psychological needs, which is consistent with the Murray (1938) perspective, and has characterized these needs as innate, which is consistent with the Hullian tradition. SDT further defines psychological needs as "nutriments that are essential for ongoing psychological growth, integrity, and well-being" (Deci & Ryan, 2000, p. 229). On the basis of this definition, satisfaction of basic psychological needs is hypothesized to result in optimal functioning and well-being.

## PSYCHOLOGICAL NEEDS: THE SDT PERSPECTIVE

SDT has identified three essential needs for optimal psychological growth and well-being: competence, relatedness, and autonomy (Deci & Ryan, 2000). According to SDT, a need for competence reflects the need to feel effective in one's efforts and capable of achieving desired outcomes. The need for relatedness involves a need to feel connected to and understood by others. Finally, autonomy reflects the need to feel volitional in one's actions, to fully and authentically endorse one's behaviors, and to act as the originator of one's own behavior. This definition of psychological needs and the specification of these particular psychological needs have been the source of considerable scientific debate. A growing body of research based on both the SDT conceptualization of

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psychological needs as well as other perspectives has provided evidence for the role of each of these needs in psychological health and well-being (Carver & Scheier, 2000; Deci & Ryan, 2000; Kernis, 2000).

A broad literature has demonstrated the importance of ongoing feelings of competence for optimal functioning and well-being. For example, White (1959) theorized that feeling competent is an integral contributor to self-confidence. Bandura's (1977) work on self-efficacy has found that believing that one can bring about desired outcomes is an important determinant of psychological health. In a related vein, Carver and Scheier (1990) have shown that believing that one is effectively making progress toward one's goals is psychologically beneficial.

The need to connect with and feel understood by others is a distinct human need that is echoed in most theories of human motivation and development (for review, see Reis & Patrick, 1996). Baumeister and Leary (1995) referred to this as the need to belong, and they reviewed extensive evidence demonstrating its vital role in human motivation. Other researchers have referred to the experience of relatedness as intimacy (Reis & Patrick, 1996; Reis & Shaver, 1988). Reis and Patrick (1996) included in their definition of intimacy the feelings of being understood, validated, and cared for, and research has shown that experiencing these aspects of intimacy results in optimum psychological and relationship functioning. Among married couples, Swann, De La Ronde, and Hixon (1994) found that feeling that one's partner knows oneself accurately is associated with experiencing greater intimacy. In studies of marital communication, feeling validated by one's partner is associated with better relationship satisfaction (Gottman, 1994), and feeling cared for by one's partner is associated with feelings of greater relationship security (Collins & Miller, 1994). Further evidence for the need for relatedness is evident in studies involving daily experiences. For example, Watson (1988) found that the more opportunities participants had to interact with important others within a given day, the more positive affect they experienced.

The need for autonomy has been perhaps the greatest source of controversy in SDT's conceptualization. This controversy has stemmed largely from misconceptions regarding the definition of autonomy (for review, see Ryan & Deci, 2000). From the SDT perspective, autonomy refers to self-government or to the extent to which people feel self-directed in their actions. However, autonomy has often been confused with independence. This has resulted in much debate regarding the seemingly competing presence of autonomy and relatedness needs. From the SDT perspective, autonomy does not involve independence or detachment from others. Rather, it involves a sense of volition, agency, and initiative. Thus, fulfillment of one's need for autonomy does not preclude feeling related to and connected with others. Indeed, Ryan and Lynch (1989) found that autonomy is positively associated with relatedness and well-being, and Hodgins, Koestner, and Duncan (1996) found that those who functioned more autonomously had more positive social experiences. Others have implied that this definition of autonomy assumes that people's behaviors occur completely independent of influence from the social environment. To the contrary, the SDT perspective on needs suggests that optimal human functioning in general and need fulfillment in particular arise out of social contexts that provide nutrients consistent with these needs. Perhaps the conceptualization of autonomy put forth

by SDT can be best clarified by comparing it with de Charms's (1968) distinction between psychological "origins" and "pawns." In contrast with origins, pawns do not feel as if they are the origins of their behavior, and they do not feel a sense of being fully engaged in their actions.

## NEED FULFILLMENT AND WELL-BEING

SDT prescribes that overall psychological health requires the satisfaction of all three needs. It is through the satisfaction of these needs that individuals are able to move toward the experience of achieving effectiveness, connectedness, and intrinsic motivation. Much of the research on SDT's notion of need fulfillment has found that satisfaction of these three needs is directly associated with well-being and that each need contributes uniquely to well-being. This has been tested in several ways, including the use of an overall index of need fulfillment, which aggregates across the three needs, and by testing the unique contribution of each need to outcomes of interest. For example, studies incorporating daily recording procedures (e.g., diaries) have found that daily fluctuations in need fulfillment predict daily fluctuations in well-being. In one study, Sheldon, Ryan, and Reis (1996) looked at both individual differences in perceived need fulfillment as well as daily fluctuations in need fulfillment. Sheldon et al. (1996) focused primarily on autonomy and competence needs, and found that, overall, individuals who generally experienced greater fulfillment of autonomy and competence needs tended to have better days on average, as indicated by their tendency to experience more positive affect and vitality and less negative affect and physical symptoms (headaches, stomach discomfort, difficulty sleeping, etc.). In addition, daily fluctuations in need fulfillment were also associated with well-being such that on days when participants experienced more need fulfillment, they also experienced greater well-being. For both between-person and within-person findings, autonomy- and competence-need fulfillment each contributed unique variance in predicting individual well-being. In a similar study examining all three needs, Reis, Sheldon, Gable, Roscoe, and Ryan (2000) reported results similar to those reported by Sheldon and colleagues (Sheldon et al., 1996). Thus, both groups of researchers found evidence for the association between need fulfillment and well-being at both between-person and within-person levels of analysis and found an independent contribution of each need to individual well-being.

Researchers examining the link between need fulfillment and well-being in specific settings have noted similar patterns of results. In studies of need fulfillment in work settings, employee reports of satisfaction of their needs for autonomy, competence, and relatedness were associated with workers' self-esteem and overall health (Ilardi, Leone, Kasser, & Ryan, 1993) and with more vitality and less anxiety and physical symptoms (Baard, Deci, & Ryan, 2000). These findings have emerged in both American and Bulgarian samples (Deci et al., 2001). Similarly, among nursing home residents, daily autonomy and relatedness-need fulfillment were positively related to well-being and perceived health (Kasser & Ryan, 1999; Vallerand & O'Connor, 1989).

## SDT AND CLOSE RELATIONSHIPS

### Self-Determined Motivation and Close Relationships

Much of the research on self-determination in close relationships has focused on relationship motivation, though more recent

research has begun to examine need fulfillment in close relationships, as described below. Blais, Sabourin, Boucher, and Vallerand (1990) examined the role of self-determined motivation in close relationships as defined by reasons for being in the relationship. They found that being motivated to maintain one's relationship for intrinsic or more self-determined reasons was associated with reporting more adaptive couple behaviors, which was in turn associated with greater couple happiness. Knee and colleagues conceptualized self-determination as growth motivation in relationships (Knee, Patrick, Vietor, Neighbors, & Nanayakkara, 2002). Similar to Blais et al. (1990), Knee et al. (2002) found that having more intrinsic or self-determined reasons for being in one's relationship was associated with more adaptive behaviors, particularly with regard to coping with relationship problems. Those who had more intrinsic reasons for being in their relationship reported engaging in more active coping strategies such as discussing problems and finding ways to constructively address problems. More recently, in a series of four studies, Knee, Lonsbary, Canevello, and Patrick (2005) examined the role of self-determined motivation in dealing with relationship conflict. In Knee et al.'s (2005) Studies 1 and 2, the researchers found evidence for a hierarchical model of relationship motivation in which general self-determination predicted relationship motivation, which in turn predicted satisfaction after disagreements (Study 1) as well as understanding responses to conflict and defensive responses to conflict (Study 2). In Knee et al.'s (2005) Studies 3 and 4, the researchers examined the role of both partners' reasons for being in the relationship and found that each partner's relationship motivation contributed uniquely to both self-reported and observed responses to conflict.

### Need Fulfillment and Autonomy Support in Close Relationships

One of the key assumptions of the SDT perspective on needs is that need fulfillment arises out of certain optimal social contexts. Thus, developing an understanding of the interplay between close relationships and need fulfillment is a natural extension of this line of research. Indeed, recent research has begun to examine the role of need fulfillment within one's relationships (Deci, La Guardia, Moller, Scheiner, & Ryan, 2006; La Guardia, Ryan, Couchman, & Deci, 2000; Ryan, La Guardia, Solky-Butzel, Chirkov, & Kim, 2005). In one of the first studies to examine the role of need fulfillment in relationships, La Guardia and colleagues examined the role of need fulfillment in attachment (La Guardia et al., 2000). Early research on attachment emphasized the continuity of attachment patterns from early childhood through adulthood (Bowlby, 1973, 1980). Support for conceptualizing attachment as a trait comes from research demonstrating stability in attachment over time (e.g., Crittenden, 1990) and similarity in attachment with different attachment figures (e.g., parents, teachers, peers; Ryan, Stiller, & Lynch, 1994). More recent research has examined within-person variations in attachment (e.g., Shaver, Collins, & Clark, 1996) and has suggested that a person's attachment to a particular other is in part a function of that person's general working model of attachment but is also partly about that person's experiences with that individual (e.g., Kobak, 1994). Thus, individuals may have different attachment styles with different relationship partners. La Guardia and colleagues proposed that need

fulfillment may be one mechanism through which these within-person variations in attachment emerge.

Across three studies, strong evidence of within-person variation in attachment emerged. Attachment was assessed for multiple attachment figures including friends, parents, romantic partners, roommates, and other important adult figures (e.g., a teacher), and a substantial proportion of the variation in attachment across these attachment figures was attributable to within-person variation. More important, within-person variation in attachment was predicted by need fulfillment. Specifically, participants were more securely attached to those who met their needs for autonomy, competence, and relatedness (La Guardia et al., 2000). This set of studies represents an important first step to examining the role of need fulfillment not only in personal well-being but also in relationship functioning and well-being. Attachment represents a bridge between these two aspects of well-being because it is in part about enduring traits of the person and is also in part a response to the social context provided by close relationships. In a related series of studies, Ryan and colleagues (Ryan et al., 2005) examined the role of need fulfillment in emotional reliance on others. Results demonstrated that there is substantial within-person variability in emotional reliance across relationship partners and that emotional reliance is positively associated with need fulfillment such that people are more likely to emotionally rely on someone to the extent that that person meets one's needs for autonomy, competence, and relatedness. In addition, need fulfillment was shown to mediate the association between emotional reliance and well-being such that those who sought emotional support from others experienced greater well-being outcomes primarily because of their tendency to rely on those who met their basic psychological needs.

Deci and colleagues (Deci et al., 2006) studied how perceived autonomy support within close friendships was related to need fulfillment and relationship quality variables. Within SDT, receiving autonomy support is theorized to be beneficial because autonomy support provides satisfaction of the basic psychological needs. In Study 1, the perception of autonomy support was associated with greater need fulfillment, emotional reliance, attachment security, dyadic adjustment, and inclusion of the friend in the self. There was also evidence of mutuality within friendships such that friends perceived similar degrees of autonomy support, need fulfillment, emotional reliance, attachment security, dyadic adjustment, and inclusion of the friend in the self. After controlling for dyad-level variance, the associations between perceived autonomy support and the relationship quality variables were no longer significant, but the association between received autonomy support and need fulfillment remained. In their Study 2, Deci et al. (2006) extended this line of research to examine how both friends' perceived autonomy support contributes to each friend's own relationship quality and personal well-being outcomes. Perceived autonomy support was assessed in terms of one's own perceptions of both giving and receiving autonomy support. Results showed that giving autonomy support uniquely predicted need satisfaction and relationship quality above that accounted for by receiving autonomy support. Regarding well-being outcomes, results indicated that giving autonomy support was more strongly related to the person's well-being than was receiving autonomy support.

In the current research, we sought to further explore the association between need fulfillment and relationship functioning and

well-being, particularly with romantic partners. We were primarily interested in how need fulfillment is associated with relationship quality, as indicated by satisfaction and commitment, and with perceptions of and responses to conflict within one's relationship.

### OTHER PERSPECTIVES ON NEED FULFILLMENT IN CLOSE RELATIONSHIPS

Several other perspectives have discussed the importance of need fulfillment in close relationships. However, many of these perspectives have dealt largely with relatedness-type needs, ignoring the importance of autonomy and competence needs as prescribed by SDT. For example, as described by Le and Agnew (2001), Drigotas and Rusbult (1992) identified five types of needs fulfilled by romantic relationships: intimacy needs, companionship needs, sexual needs, security needs, and emotional involvement needs. Intimacy needs relate to confiding in each other, sharing thoughts, and disclosing feelings. Companionship needs involve spending time and enjoying activities together. Sexual needs include the full range of physical relations from holding hands to intercourse. Security needs involve relationship stability and the extent to which one can depend on the relationship to make life feel more secure. Emotional involvement needs refer to the degree to which one partner's affective states influence the other partner's emotional experiences. In SDT, these five needs would all fall under relatedness. Thus, this characterization of relationship needs ignores needs for competence and autonomy in the context of romantic relationships.

Prager and Buhrmester (1998) examined whether intimacy contributes to individual need fulfillment. They cluster analyzed 237 human needs derived from the writings of personality theorists and found that 19 basic needs emerged with overall dimensions of agentic, communal, and survival needs. On the surface, agentic needs appear similar to SDT's need for autonomy, communal needs appear similar to SDT's need for relatedness, and survival needs appear similar to SDT's need for competence. On closer examination, however, agentic needs included terms like power prestige (e.g., the need to have an impact on others) and avoiding self-esteem loss, which would, if anything, be the opposite of the need for autonomy according to SDT. Further, survival needs included aspects such as relief from anxiety and hunger, which do not seem to be at the same level of abstraction as SDT's need for competence. Prager and Buhrmester's (1998) Need Fulfillment Inventory, derived from the cluster analyses, settled on agency and communion as the two dimensions of need fulfillment, consistent with Bakan's (1966) conception of the principle psychological dimensions of human existence. These two needs are conceptually similar to SDT's notion of autonomy and relatedness, though the agency and communion perspective fails to take into account competence needs. Prager and Buhrmester (1998) found that intimacy predicted need fulfillment, which in turn predicted psychological well-being (e.g., greater life satisfaction, less anxiety).

### OVERVIEW

The current studies go beyond previous research by examining (a) the role of need fulfillment in relationship well-being including satisfaction, commitment, perceived conflict, and responses to conflict (Studies 1 and 2); (b) the degree to which one's partner's

need fulfillment plays a role in one's own relationship well-being (Study 2); (c) the role of need fulfillment in responses to naturally occurring conflicts in one's relationships (Study 3); and (d) the mediating role of relationship motivation in the association between need fulfillment and relationship quality following disagreements (Study 3). As in previous research, we also examined the unique contribution of each need to these outcomes. SDT posits that fulfillment of all three needs is necessary for optimal personal well-being, although it is not clear if all three needs are equally important when it comes to indicators of relationship functioning and well-being. Indeed, La Guardia and colleagues found that when the needs were examined individually, each was significantly associated with attachment, although relatedness-need fulfillment was the strongest unique predictor of attachment (La Guardia et al., 2000).

In Study 1, we tested the associations between need fulfillment within one's relationship and indicators of individual (e.g., self-esteem) and relationship (e.g., satisfaction) well-being as well as the unique contribution of each need to these outcomes. In Study 2, we further explored the role of need fulfillment in relationship well-being by testing whether one's partner's need fulfillment predicts one's own relationship well-being and whether certain combinations of partners' need fulfillment were particularly beneficial (i.e., the interaction between each partner's need fulfillment in predicting outcomes). Finally, in Study 3, we sought to better understand the mechanisms through which need fulfillment is associated with relationship well-being, particularly with regard to satisfaction and commitment following conflict in daily life. Thus, in Study 3, we tested a model integrating need fulfillment, relationship motivation, and relationship quality following disagreements.

### STUDY 1

The purpose of Study 1 was to examine how need fulfillment in one's relationship is associated with both individual and relationship functioning and well-being and to test the unique contribution of each need to these outcomes. Consistent with previous research on the role of need fulfillment in well-being, indicators of individual well-being included trait self-esteem, positive and negative affect, and vitality. (e.g., Reis et al., 2000; Sheldon et al., 1996). Indicators of relationship well-being included relationship quality (satisfaction, commitment), perceptions of conflict, and reported responses to conflict. Participants were involved in romantic relationships at the time of assessment. We examined the association between these outcomes and need fulfillment with respect to one's romantic partner. Several samples of data were gathered, with constructs assessed in at least two and up to eight samples. For efficiency of presentation and ease of discussion, associations across samples were combined using meta-analytic procedures, correcting for unreliability of measurement.<sup>1</sup>

### Method

#### *Samples*

Eight samples that measured need fulfillment in one's romantic relationship were included in analyses. Participants in all samples

<sup>1</sup> These data have not been published elsewhere and were gathered by the authors and associated colleagues.

were involved in romantic relationships at the time data were collected. Table 1 provides descriptive information for each individual sample and for the combined sample. Sample sizes ranged from 94 to 503, yielding an average of 240 participants per sample and a total of 1,918 observations overall. Across samples, the mean age was 22 years, and the average relationship length was approximately 3 years. On average, 81% of participants in these samples were female. This is due in part to the greater likelihood of women to volunteer to participate in studies on relationships at the university where these data were collected.

### Meta-Analytic Technique

Estimates across samples were meta-analytically combined. This procedure was used to most accurately and parsimoniously estimate the effect size from the available data. In the first set of analyses, Pearson's  $r$  was the effect-size index used in the meta-analytic estimates (Rosenthal & Rosnow, 1991). The distribution of  $r$ s sampled from the population becomes more skewed as  $r$  in the population increases (Rosenthal, 1994). Thus, Fisher's  $Z_r$  transformation was used to correct for the increase in skew. Then, each  $Z_r$  was weighted by the inverse of the sampling error variance, which gave greater weight to more precise and reliable effects resulting from larger, more representative estimates of the population correlation (Hedges & Olkin, 1985). All estimates were corrected for attenuation due to measurement error of both variables in each effect. This approach was used as recommended by Hunter and Schmidt (1990, 1994) to come as close as possible to estimating the size of the effect as it would appear under ideal circumstances. The standard correction following Hunter and Schmidt (1990) was implemented as follows:

$$ES'_r = [ES_r] / [\sqrt{r_{xx}} \times \sqrt{r_{yy}}],$$

where  $ES'_r$  is the adjusted effect  $r$ ,  $ES_r$  is the uncorrected effect  $r$ , and  $r_{xx}$  and  $r_{yy}$  are the reliability estimates for each variable in the correlation. A similar correction was applied to the inverse variance estimate. This meta-analytic procedure was repeated for the second set of analyses in which partial correlation ( $pr$ ) was the effect size used.

### Measures

#### Need Fulfillment

Participants completed the Basic Need Satisfaction in Relationships Scale (La Guardia et al., 2000). The measure consists of nine

items rated from 1 (*not at all true*) to 7 (*very true*). The measure assesses the extent to which participants feel that their romantic partner supports their needs for autonomy, competence, and relatedness. An overall need fulfillment score is derived by averaging all nine items, with higher scores indicating greater need fulfillment. Subscale scores for autonomy, competence, and relatedness needs are calculated by averaging autonomy, competence, and relatedness items separately. Sample items are "When I am with my partner, I feel free to be who I am" (autonomy), "When I am with my partner, I feel like a competent person" (competence), and "When I am with my partner, I feel loved and cared about" (relatedness). Internal reliabilities (Cronbach's  $\alpha$ s) in these samples ranged from .86 to .90 for overall need fulfillment, from .59 to .76 for autonomy, from .67 to .79 for competence, and from .75 to .82 for relatedness. Consistent with La Guardia et al. (2000), we also computed a composite index of autonomy and competence-need fulfillment to rule out the possibility that findings for overall need fulfillment were simply an artifact of the role of relatedness-need fulfillment in relationship contexts and that findings regarding the unique role of relatedness-need fulfillment were not simply a function of competing variance between autonomy and competence needs. Internal reliabilities (Cronbach's  $\alpha$ s) in these samples ranged from .75 to .85.

#### Individual Well-Being

*Self-esteem.* The Rosenberg (1965) Self-Esteem Scale was used to assess global self-esteem. The measure consists of 10 items answered on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Items are averaged, and negative items are reverse-scored such that higher scores indicate higher self-esteem. Internal reliability (Cronbach's  $\alpha$ ) ranged from .86 to .90 in the samples reported here.

*Emotion.* The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess positive and negative emotion. The measure includes 10 positive and 10 negative adjectives. Participants rated the extent to which they felt each emotion on a 1 (*very slightly or not at all*) to 5 (*extremely*) scale. Internal reliabilities (Cronbach's  $\alpha$ s) in these samples ranged from .86 to .89 for positive affect and from .83 to .89 for negative affect.

*Vitality.* Participants completed a measure of trait-based subjective vitality (Ryan & Frederick, 1997). The measure consists of seven items designed to measure general feelings of vitality and

Table 1  
Study 1: Descriptive Statistics Overall and by Sample

Sample	<i>N</i>	% female	Mean age	Mean relationship length (years)	Mean number of previous relationships
1	204	82	23.1 (4.9)	2.6 (2.5)	1.9 (1.0)
2	163	75	24.5 (6.0)	3.3 (4.1)	1.9 (1.5)
3	94	88	23.2 (7.5)	4.3 (6.7)	1.6 (1.0)
4	368	82	23.0 (5.3)	3.0 (3.8)	2.0 (1.5)
5	217	82	21.1 (3.9)	2.0 (2.1)	1.7 (1.4)
6	113	83	22.2 (4.5)	3.8 (3.9)	1.4 (1.4)
7	503	78	21.1 (4.9)	2.3 (3.2)	1.8 (1.8)
8	266	81	22.6 (5.2)	2.5 (2.6)	1.8 (1.3)
Total	1,918	81	22.6 (4.8)	2.7 (3.3)	1.8 (1.5)

Note. Numbers presented parenthetically are standard deviations for the respective samples.

energy, and items are answered on a 1 (*not at all true*) to 7 (*very true*) scale. Sample items include "I feel alive and vital," and "I look forward to each new day." Items are averaged, and negative items are reverse-scored such that higher scores indicate greater vitality. Internal reliability (Cronbach's  $\alpha$ ) was .91 in the samples reported here.

### Attachment Style

There are currently a variety of self-report measures available to assess adult attachment. Brennan, Clark, and Shaver (1998) provided evidence for the validity of a 36-item measure derived from a factor analysis of most of the existing self-report measures of adult romantic attachment. Accordingly, in this study, participants completed the Experiences in Close Relationships (ECR; Brennan et al., 1998) measure of adult attachment. The measure yields two subscales, Avoidance and Anxious, which are scored continuously such that all participants receive a score on both dimensions. Internal reliabilities (Cronbach's  $\alpha$ s) in the samples reported here ranged from .90 to .93 for Avoidance and from .90 to .91 for Anxious. Attachment was included in this study because of its unique role as both a trait and a state (i.e., a characteristic that emerges in response to the context provided in particular relationships), thus serving as an indicator of both personal and relational functioning and well-being.

### Relationship Well-Being

*Satisfaction.* Satisfaction was assessed by the Quality of Relationship Index (QRI), adapted from the Quality of Marriage Index (Norton, 1983). The QRI consists of six Likert-type items that assess the extent to which individuals are satisfied and happy with their relationship (e.g., "My relationship with my partner makes me happy"). Items are averaged such that higher scores reflect higher relationship satisfaction. Internal reliability (Cronbach's  $\alpha$ ) in the samples reported here ranged from .85 to .94.

*Commitment.* Commitment was assessed with five items on 9-point Likert-type scales (Rusbult, Verette, Whitney, Slovik, & Lipkus, 1991). The items emphasize both feelings of commitment and likelihood of becoming less committed (e.g., "How likely is it that you will date someone other than your partner in the next year?"). Items are averaged such that higher scores reflect greater commitment. Internal reliability (Cronbach's  $\alpha$ ) ranged from .88 to .92 in the samples reported here.

*Perceived conflict.* Perceptions of conflict were assessed with 13 items rated from 1 (*always agree*) to 7 (*always disagree*), based on the consensus subscale of the Dyadic Adjustment Scale (Spanier, 1976). Participants reported the degree to which they have disagreements with their partner on each of 13 issues (e.g., demonstrations of affection). Internal reliability (Cronbach's  $\alpha$ ) in these samples ranged from .82 to .88.

*Understanding and defensive responses to conflict.* Self-reported responses to conflict were assessed with 12 items developed to represent attempts to better understand the conflict or avoid it. For each item, participants completed the statement, "After you and your partner have a disagreement or misunderstanding, to what extent do you tend to feel that it led you to \_\_\_\_\_." Items were rated from 1 (*not at all*) to 7 (*very much*). Subscale scores were created by averaging understanding

and defensive items separately. Sample items for the understanding subscale are "Explore other points of view" and "Understand your relationship better." Sample items for the defensive subscale are "Want to leave or walk away," and "Feel distant or detached from your partner." Internal reliabilities (Cronbach's  $\alpha$ s) ranged from .80 to .84 for understanding responses and from .72 to .80 for defensive responses.

## Results and Discussion

### Effect Size: Correlations (Pearson's $r$ )

Table 2 provides effect size estimates (Pearson's  $r$ ; Rosenthal & Rosnow, 1991) along with the number of samples and participants on which each estimate is based. In addition, 95% confidence intervals (CIs) were calculated along with significance tests of the overall effect estimate. Finally, the range of individual correlations from each sample is provided along with the standard error of the means.

As shown, need fulfillment was positively associated with self-esteem, positive affect, and vitality and was negatively associated with negative affect. For attachment variables, need fulfillment was negatively associated with both avoidant and anxious attachment. Regarding relationship functioning and well-being variables, need fulfillment was positively associated with relationship satisfaction and commitment and with reporting more understanding responses to conflict. Need fulfillment was also associated with perceiving less conflict and with reporting less defensive responses to conflict. Though not shown in Table 2, a similar pattern of findings emerged for the composite of autonomy and competence needs and for each of the needs individually.

Regarding the meta-analytically averaged correlations among the need fulfillment subscales, autonomy and relatedness were strongly correlated across samples ( $r = .86, p < .0001, 95\% \text{ CI} = .80 \text{ to } .92, \text{ CI } z = 41.83$ ), and competence and relatedness were strongly correlated across samples ( $r = .84, p < .0001, 95\% \text{ CI} = .78 \text{ to } .90, \text{ CI } z = 40.55$ ). Because the correlation between autonomy and competence was higher than the reliability of the scale(s) in several samples, we computed an uncorrected meta-analytically averaged correlation between these two subscales that does not take into account the reliability of the scales. Even with this conservative approach, autonomy and competence needs were strongly correlated ( $r = .68, p < .0001, \text{ CI} = .64 \text{ to } .73, \text{ CI } z = 36.22$ ). We also examined associations between need fulfillment and several other potential covariates. Regarding gender, there was a significant but modest association between need fulfillment and sex such that women experienced somewhat more overall need fulfillment ( $r = -.10, p < .001$ ); a similar pattern emerged for each of the needs individually. There was also a significant but modest association between overall need fulfillment and age such that younger individuals experienced somewhat more need fulfillment ( $r = -.05, p < .05$ ); a similar correlation emerged for relatedness but not for autonomy or competence. There were no significant correlations between need fulfillment and number of previous relationships or relationship length; thus, it was unlikely that participants experienced greater need fulfillment as a function of having more relationship experiences or being involved in longer term relationships (all  $r$ s  $< .04$ ).

Table 2  
*Study 1: Effect Size Estimates for Meta-Analytically Combined Associations Between Overall Need Fulfillment and Indicators of Individual and Relationship Well-Being*

Characteristic	<i>k</i>	<i>N</i>	<i>r</i>	95% CI	CI <i>z</i>	Range of <i>r</i>	<i>SE</i> of mean
Individual well-being							
Self-esteem	8	1,918	.42***	.36 to .47	16.88	.27 to .47	.03
Positive affect	4	955	.42***	.34 to .49	12.05	.32 to .54	.04
Negative affect	4	955	-.43***	-.50 to -.35	12.27	-.30 to -.47	.04
Vitality	2	484	.42***	.32 to .52	8.76	.32 to .44	.05
Attachment							
Avoidant	4	1,345	-.56***	-.62 to -.50	20.18	-.43 to -.60	.03
Anxious	4	1,345	-.50***	-.56 to -.44	17.93	-.34 to -.60	.03
Relationship well-being							
Relationship quality							
Satisfaction	8	1,918	.72***	.67 to .77	35.11	.52 to .73	.03
Commitment	7	1,561	.57***	.52 to .63	22.57	.39 to .63	.03
Perceived conflict	5	1,354	-.61***	-.67 to -.55	22.26	-.49 to -.63	.03
Responses to conflict							
Understanding	5	1,467	.34***	.28 to .40	11.54	.23 to .34	.03
Defensiveness	5	1,467	-.51***	-.58 to -.44	17.56	-.33 to -.51	.03

*Note.* Results were similar for the autonomy–competence composite and the autonomy, competence, and relatedness subscales. *k* = number of samples; *N* = total number of observations; *r* = correlation coefficient; 95% CI = 95% confidence interval for partial correlation coefficient; CI *z* = *z* test of the mean effect size. \*\*\* *p* < .001.

*Effect Size: pr*

The first set of analyses provided evidence for the role of need fulfillment in individual and relationship well-being as well as attachment. However, these analyses did not address the question of the unique contribution of each need to individual and relationship indicators and whether particular needs play a more dominant role in particular outcomes. To address this issue, we calculated *prs* for each sample and meta-analytically combined effect sizes, as described above. Table 3 provides effect size estimates (*prs*)

testing the unique contribution of autonomy, competence, and relatedness-need fulfillment in predicting individual and relationship functioning and well-being. The *prs* reflect the association between each need and the outcomes, controlling for each of the other needs. The table provides information on the number of samples and participants on which each estimate is based. In addition, 95% CIs were calculated along with significance tests of the overall effect estimates. For those interested, the range of *prs* and the standard error of the means from each sample are provided in the Appendix.

Table 3  
*Study 1: Effect Size Estimates (Partial Correlations: pr) for Meta-Analytically Combined Associations Between Need Fulfillment and Indicators of Individual and Relationship Well-Being*

Characteristic	<i>k</i>	<i>N</i>	Autonomy			Competence			Relatedness		
			<i>pr</i>	95% CI	CI <i>z</i>	<i>pr</i>	95% CI	CI <i>z</i>	<i>pr</i>	95% CI	CI <i>z</i>
Individual well-being											
Self-esteem	8	1,918	.14***	.08 to .20	4.69	.39***	.33 to .44	14.26	.04	-.20 to .09	1.29
Positive affect	4	955	-.01	-.09 to .07	0.19	.24***	.16 to .32	6.04	.25***	.17 to .32	6.50
Negative affect	4	955	-.17***	-.25 to -.09	4.21	-.19***	-.27 to -.11	4.76	-.16***	-.23 to -.08	4.11
Vitality	2	484	-.00	-.11 to .10	0.08	.21***	.10 to .32	3.72	.21***	.11 to .32	4.02
Attachment											
Avoidant	4	1,345	-.17***	-.23 to -.10	4.99	-.01	-.08 to .06	0.30	-.42***	-.49 to -.36	14.07
Anxious	4	1,345	-.17***	-.23 to -.10	4.99	-.13***	-.20 to -.06	3.84	-.24***	-.30 to -.18	7.51
Relationship well-being											
Relationship quality											
Satisfaction	8	1,918	.11***	.06 to .17	3.94	.09**	.03 to .14	3.18	.65***	.59 to .70	28.44
Commitment	7	1,561	.07*	.01 to .13	2.11	.05	-.01 to .11	1.56	.59***	.53 to .65	22.45
Perceived conflict	5	1,354	-.21***	-.28 to -.14	5.87	-.12***	-.19 to .05	3.51	-.35***	-.41 to -.28	10.76
Responses to conflict											
Understanding	5	1,467	.07*	.01 to .14	2.11	.10**	.03 to .17	2.95	.21***	.14 to .28	6.33
Defensive	5	1,467	-.15***	-.22 to -.08	4.09	-.12***	-.19 to .05	3.51	-.22***	-.29 to -.16	6.65

*Note.* *k* = number of samples; *N* = total number of observations; 95% CI = 95% confidence interval for *pr*; CI *z* = *z* test of the mean effect size. \* *p* < .05. \*\* *p* < .01. \*\*\* *p* < .001.

As shown, competence-need fulfillment was shown to play the most consistent and unique role in individual well-being indicators. Competence was positively and uniquely associated with self-esteem, positive affect, and vitality and was negatively and uniquely associated with negative affect. Autonomy was positively and uniquely associated with self-esteem and was negatively associated with negative affect. Finally, relatedness-need fulfillment was uniquely and positively associated with positive affect and vitality. We now turn to the analyses for attachment. Consistent with what La Guardia and her colleagues reported, relatedness-need fulfillment was uniquely and negatively associated with the two attachment dimensions, as was autonomy-need fulfillment (La Guardia et al., 2000). Results from analyses testing the unique contribution of each need to indicators of relationship functioning and well-being were also intriguing. As shown in Table 3, each need was uniquely and positively associated with satisfaction and understanding responses to conflict and was uniquely negatively associated with perceived conflict and defensiveness. Only autonomy and relatedness needs were uniquely (positively) associated with commitment.

We were also interested in the magnitude of the contribution of each need to these outcomes. Using the *Z* test procedure for nonindependent correlation coefficients described by Meng, Rosenthal, and Rubin (1992), we compared the coefficients for autonomy versus relatedness-need fulfillment and competence versus relatedness-need fulfillment. Results showed that both autonomy ( $Z = 8.23, p < .0001$ ) and competence ( $Z = 25.33, p < .0001$ ) were significantly stronger predictors of self-esteem than was relatedness-need fulfillment. Relatedness was a stronger predictor of positive affect ( $Z = 14.94, p < .0001$ ) and vitality ( $Z = 8.61, p < .0001$ ) than was autonomy-need fulfillment. Of particular interest for this study was the magnitude of the contribution of relatedness-need fulfillment to relationship-relevant variables. Regarding attachment, relatedness-need fulfillment was a stronger predictor of anxious attachment than was autonomy ( $Z = 4.75, p < .0001$ ) or competence-need fulfillment ( $Z = 6.79, p < .0001$ ). The same pattern emerged for avoidant attachment (autonomy,  $Z = 16.46, p < .0001$ ; competence,  $Z = 24.70, p < .0001$ ). Relatedness was also a stronger predictor of satisfaction (autonomy,  $Z = 39.90, p < .0001$ ; competence,  $Z = 37.67, p < .0001$ ), commitment (autonomy,  $Z = 35.47, p < .0001$ ; competence,  $Z = 33.50, p < .0001$ ), perceived conflict (autonomy,  $Z = 9.34, p < .0001$ ; competence,  $Z = 14.03, p < .0001$ ), understanding responses to conflict (autonomy,  $Z = 10.01, p < .0001$ ; competence,  $Z = 7.13, p < .0001$ ), and defensive responses to conflict (autonomy,  $Z = 4.98, p < .0001$ ; competence,  $Z = 6.47, p < .0001$ ). Thus, there was clear and convincing evidence that relatedness was the strongest unique predictor of relationship functioning and well-being outcomes.

As noted above, autonomy and competence needs were highly correlated. In fact, when using a less conservative meta-analytic approach, in which the two samples contained higher correlations between the scales than between the reliabilities of the scales, we found that the meta-analytically combined correlation between autonomy and competence was quite high ( $r = .96, p < .0001$ ,  $CI = .88$  to  $1.0$ ,  $CI z = 49.29$ ). Therefore, it was possible that the lack of unique association between autonomy and competence needs and many of the outcomes of interest was simply a function of shared variance between autonomy and competence being di-

vided when these subscales were entered as separate subscales. To address this possibility, we repeated all of the above analyses using a composite of autonomy and competence in addition to the relatedness subscale. Results for this set of analyses were nearly identical to the original analyses in which autonomy and competence were treated as separate predictors.

It was also possible that the associations that emerged between need fulfillment and some of the relationship variables, notably satisfaction and commitment, may have been driven by conceptual overlap of item content between the need fulfillment measure and the measures of satisfaction and commitment incorporated here. There are both conceptual and empirical reasons for why we believe this was not the case. Empirically, with the exception of one extreme value, the range of correlations between need fulfillment and satisfaction and between need fulfillment and commitment are not notably different from the range of correlations between need fulfillment and any of the other outcome variables, including those for individual well-being (see Table 2). If overlapping item content was responsible for the correlations, one would expect correlations between need fulfillment and satisfaction and commitment to be larger in magnitude than correlations between need fulfillment and other variables. Conceptually, there is, of course, some similarity between these constructs. Need fulfillment, satisfaction, and commitment all tap positive experiences in one's relationship, and one would expect some overlap in these types of experiences. Despite these similarities, there are some important conceptual distinctions worth noting. Most important, need fulfillment items address how one feels with one's partner regarding autonomy, competence, and relatedness (e.g., "When I am with my partner, I am free to be who I am"; "When I am with my partner I feel like a competent person"; "When I am with my partner I feel loved and cared for"). These are conceptually distinct items from those assessing the extent to which one is happy with one's relationship more generally (e.g., "My relationship with my partner makes me happy") and the extent to which one intends to stay in one's relationship (e.g., "For how much longer do you want your relationship to last?").

Together, these results support much of the existing literature on the association between need fulfillment and individual well-being and shed light on the role of need fulfillment from one's partner in relationship functioning and well-being. These results suggest that relatedness-need fulfillment may play a particularly stronger role in relationship functioning and well-being.

## STUDY 2

Study 1 provided initial evidence for the role of need fulfillment in relationship functioning and well-being. In Study 2, we further explored these associations by examining these processes among couples. It is possible that both partners' perceived need fulfillment uniquely contributes to relationship functioning and well-being such that one benefits not only from experiencing need fulfillment oneself but also from one's partner experiencing need fulfillment. This potential for partners to influence each other is one of the defining characteristics of close relationships (Kelley & Thibaut, 1978). Thus, in Study 2, we gathered data from both partners using a sample of couples. This design allowed for simultaneous estimation of the role of both partners' need fulfillment in relationship functioning and well-being. The Actor-Partner Inter-



dependence Model (APIM; Kashy & Kenny, 2000) allows for the capacity to directly model the mutual influence that may occur between individuals in a dyadic relationship (Campbell & Kashy, 2002). Further, APIM allows for tests of interactions to determine whether certain combinations of both partners' scores on predictor variables are particularly beneficial for relationship functioning and well-being.

Deci and colleagues (Deci et al., 2006) examined both giving and receiving autonomy support as unique predictors of relationship quality between friends. They hypothesized and found that, given the reciprocal nature of close relationships, there should be some degree of mutuality in terms of autonomy support between friends. That is, friends' perceptions of receiving autonomy support are correlated. More important, they hypothesized and found that one's friend receiving autonomy support benefited one's own perceptions of the friendship, including one's feelings of need fulfillment within the friendship. In the current research, we sought to examine similar processes with regard to both partners' perceptions of need fulfillment. Here, we assessed perceived need fulfillment from both members of the dyad, whereas Deci et al. (2006) operationalized "autonomy support given" as one's own perception of whether one's friend experiences autonomy support within the friendship. Deci et al. (2006) hypothesized that giving autonomy support was another way in which individuals experienced need fulfillment (i.e., an individual giving autonomy support may experience competence in response to the friend receiving autonomy support, relatedness as a function of caring for one's friend, and autonomy in response to volitionally doing something that one valued through giving to the friend). In the same way, we expected that both partners' need fulfillment would uniquely contribute to one's own relationship functioning and well-being.

## Method

### *Participants and Procedure*

Sixty-six couples who had been in their relationship for 1 month or longer were recruited from introductory psychology classes. Participants ranged in age from 18 to 55 years ( $M = 23.0$ ,  $SD = 5.4$ ) and had been in their current relationship for an average of 2.5 years ( $SD = 2.0$ ). The sample was ethnically diverse with 39% Caucasian, 18% Asian, 17% Hispanic, 16% African-American, and 8% who chose "Other." With regard to relationship status, 48% of participants were exclusively dating, 20% were married, 18% were nearly engaged, 10% were engaged, and 2% were casually dating. Participants completed questionnaire packets in a Latin square design; they were asked to complete the packets in a single setting and to answer the questions independently from their romantic partner.

### *Measures*

The measures used in Study 2 were the same as those used in Study 1 to assess need fulfillment and indicators of relationship functioning and well-being. Internal reliabilities (Cronbach's  $\alpha$ s) for need fulfillment were .88, .82, .62, .79, and .76 for overall need fulfillment, the autonomy-competence composite, autonomy, competence, and relatedness, respectively. For relationship quality, internal reliabilities (Cronbach's  $\alpha$ s) were .90 for both satis-

faction and commitment. Finally, internal reliabilities (Cronbach's  $\alpha$ s) for perceived conflict, understanding responses to conflict, and defensive responses to conflict were .88, .81, and .76, respectively.

In this study, we also included a measure of perceived closeness. We assessed this with the Inclusion of Other in the Self (IOS) Scale pictorial instrument (Aron, Aron, & Smollan, 1992). The IOS Scale taps aspects of feeling connected and behaving interdependently. The measure consists of a series of two circles (labeled *self* and *other*) that overlap to equally increasing degrees in seven stages. Participants selected the picture that best describes their relationship, and their selection was translated into a score from 1 to 7, with a higher score reflecting more IOS.

## Results and Discussion

### *Preliminary Analyses*

Table 4 provides within-couple correlations along the diagonal as well as correlations between variables for men (above the diagonal) and women (below the diagonal). As shown, overall need fulfillment was positively associated with satisfaction and commitment and was negatively associated with perceived conflict and defensive responses to conflict for both men and women. The same pattern emerged for autonomy, competence, and relatedness needs. Need fulfillment was also positively associated with understanding responses to conflict among women, but this correlation was not statistically significant for men. Within-couple correlations revealed significant associations between partners for overall need fulfillment, autonomy, relatedness, satisfaction, perceived conflict, and defensive responses to conflict. Partners' competence-need fulfillment, commitment, and understanding responses to conflict were not significantly correlated.

### *Analytic Strategy*

The structure of these data was nested because data were collected from both partners. APIM (Campbell & Kashy, 2002; Kashy & Kenny, 2000) was used to model the nonindependence of dyadic data and to test whether one's partner's need fulfillment uniquely predicts one's own relationship functioning and well-being. In these analyses, an actor effect occurs when one's own score on need fulfillment predicts one's own score on the criterion (e.g., satisfaction); a partner effect occurs when one's partner's score on need fulfillment predicts one's own score on the criterion. We used the PROC MIXED routine in SAS with restricted likelihood estimation to estimate the coefficients (see Campbell & Kashy, 2002). Gender was included to control for potential variation between men and women. Interactions between actor and partner effects were included in a separate step to examine how the combination of partners' need fulfillment was related to relationship quality, perceived conflict, and responses to conflict.

### *Main Effects*

The first set of equations included the main effects for actor and partner need fulfillment and gender. PROC MIXED estimates coefficients for a single criterion at a time, and thus satisfaction, commitment, perceived conflict, understanding responses to conflict, and defensive responses to conflict were examined separately. Analyses of actor and partner effects were conducted sep-

Table 4

Study 2: Correlations among Need Fulfillment, Relationship Quality, Perceived Conflict, and Responses to Conflict

Characteristic	1a	1b	1c	1d	2a	2b	3	4a	4b
1. Need fulfillment									
1a. Overall	<b>.38**</b>	.87***	.91***	.91***	.66***	.44***	-.36**	.04	-.59***
1b. Autonomy	.84***	<b>.30**</b>	.69***	.72***	.56***	.40***	-.31**	.04	-.51***
1c. Competence	.82***	.58***	<b>.06</b>	.75***	.57***	.33**	-.35**	.00	-.55***
1d. Relatedness	.77***	.56***	.36**	<b>.49***</b>	.65***	.46***	-.32**	.07	-.55***
2. Relationship quality									
2a. Satisfaction	.41***	.32**	.14	.57***	<b>.50***</b>	.56***	-.47***	.15	-.59***
2b. Commitment	.33**	.24*	.19	.38**	.48***	<b>.14</b>	-.39***	.01	-.45***
3. Perceived conflict	-.50***	-.38**	-.28*	-.58***	-.61***	-.19	<b>.37**</b>	-.50***	.54**
4. Responses to conflict									
4a. Understanding	.44***	.36**	.19	.54***	.39**	.24*	-.23	<b>.21</b>	-.38**
4b. Defensiveness	-.63***	-.52***	-.45***	-.57***	-.52***	-.26*	.51***	-.55***	<b>.32**</b>

Note. Values along the diagonal represent within-couple correlations. Values above the diagonal are correlations for men; values below the diagonal are correlations for women.

\*  $p \leq .05$ . \*\*  $p < .01$ . \*\*\*  $p < .001$ .

arately for each indicator of need fulfillment (i.e., overall need fulfillment and autonomy, competence, and relatedness needs individually). Table 5 provides coefficients for actor and partner effects of overall need fulfillment predicting relationship functioning and well-being. As shown, actor overall need fulfillment was positively associated with satisfaction and commitment and was negatively associated with perceived conflict and defensiveness. More important, partner overall need fulfillment was uniquely and positively associated with satisfaction and was negatively associated with perceived conflict and defensiveness. A similar pattern of findings emerged for both actor and partner effects for the autonomy and competence composite and for the autonomy and competence needs individually. Findings for relatedness needs were somewhat different. Specifically, in addition to the actor relatedness associations reported for overall need fulfillment, actor relatedness was positively associated with understanding, and the only significant relatedness partner effect was for satisfaction. Thus, it appears that both actor and partner need fulfillment uniquely contribute to relationship functioning and well-being, primarily for autonomy and competence. For relatedness, it appears that actor perceptions play a more dominant role.<sup>2</sup>

### Interactions

We also tested whether the combination of partners' perceived need fulfillment was related to the outcomes of interest. These analyses yielded several interesting findings, primarily for relatedness. First, in predicting satisfaction, a significant interaction between actor and partner relatedness-need fulfillment emerged,  $t(62) = 3.19, p < .01, pr = .37$ . We selected data points for estimating regression lines at  $\pm 1$  SD for predictors of the equation (Aiken & West, 1991). Figure 1 provides simple regression lines of satisfaction as a function of actor relatedness-need fulfillment at high and low levels of partner relatedness-need fulfillment. As shown, tests of simple slopes revealed that the association between actor relatedness-need fulfillment and satisfaction was stronger when one's partner also experienced greater relatedness-need fulfillment,  $t(101) = 6.75, p < .0001, pr = .58$ , relative to when one's partner experienced less relatedness-need fulfillment,  $t(101) = 4.18, p < .0001, pr = .38$ , suggesting that partners are

more satisfied in their relationship to the extent that both partners experienced greater relatedness-need fulfillment.

There was also a significant Actor  $\times$  Partner interaction for relatedness-need fulfillment when predicting perceived conflict,  $t(62) = -2.22, p < .05, pr = -.27$ . Figure 2 provides the simple regression lines of perceived conflict as a function of actor relatedness-need fulfillment at high and low levels of partner relatedness-need fulfillment. As shown, tests of simple slopes indicated that the negative association between actor relatedness-

<sup>2</sup> Main effects for gender also emerged. Results are reported here for analyses involving overall need fulfillment, although a similar pattern emerged for each need individually. Gender was associated with satisfaction, perceived conflict, and defensiveness such that women were more satisfied than men,  $t(63) = -2.24, p < .05, \beta = -.16, pr = -.27$ , women perceived less conflict than men,  $t(63) = 2.87, p < .01, \beta = .23, pr = .34$ , and women were more defensive than men,  $t(63) = -2.44, p < .05, \beta = -.15, pr = .29$ . There were also a few interactions between actor effects and gender. First, there was a significant Gender  $\times$  Actor Overall Need Fulfillment interaction in predicting understanding,  $t(94.3) = -2.53, p < .05, pr = -.25$ . Tests of simple slopes revealed that the association between actor need fulfillment and understanding responses to conflict was significant for women,  $t(102) = 3.24, p < .01, pr = .31$ , but not for men,  $t(117) = -0.10, ns$ . This same pattern of findings emerged for autonomy, competence, and relatedness needs. There were also two significant Gender  $\times$  Competence-Need Fulfillment interactions: one for actor competence predicting satisfaction,  $t(110) = 3.02, p < .01, pr = .28$ , and one for partner competence predicting defensive responses to conflict,  $t(119) = 2.77, p < .01, pr = .25$ . Tests of simple slopes revealed that the association between actor competence-need fulfillment and satisfaction was significant for men,  $t(114) = 5.52, p < .0001, pr = .46$ , but not for women,  $t(117) = 0.89, ns$ . In predicting defensive responses to conflict, tests of simple slopes showed that the association between partner competence-need fulfillment and defensive responses to conflict was significant for women,  $t(121) = -4.04, p < .0001, pr = -.34$ , but not for men,  $t(121) = 0.10, ns$ . Finally, there was a significant Gender  $\times$  Actor interaction for relatedness-need fulfillment that predicted perceptions of conflict,  $t(86.2) = 1.94, p = .05, pr = .20$ . Tests of simple slopes revealed that the association between actor relatedness-need fulfillment and perceptions of conflict was significant for women,  $t(116) = -3.93, p < .0001, pr = -.34$ , but not for men,  $t(116) = -1.50, ns$ .

Table 5  
*Study 2: APIM Analyses Testing the Unique Contribution of Actor and Partner Overall Need Fulfillment to Relationship Variables*

Characteristic	Overall need fulfillment							
	Actor				Partner			
	<i>B</i>	<i>SE B</i>	$\beta$	<i>pr</i>	<i>B</i>	<i>SE B</i>	$\beta$	<i>pr</i>
Relationship quality								
Satisfaction	0.49	.07	.53***	.49	0.29	.07	.31***	.32
Commitment	0.47	.10	.43***	.39	0.05	.10	.05	.05
Perceived conflict	-0.37	.01	-.38***	-.35	-0.17	.09	-.17*	-.17
Responses to conflict								
Understanding	0.19	.11	.14	.15	0.17	.11	.12	.13
Defensiveness	-0.79	.10	-.47***	-.56	-0.21	.10	-.14*	-.18

*Note.* Results were similar for the autonomy–competence composite and for both the autonomy and competence need fulfillment subscales. For relatedness, there was also a positive association between actor relatedness-need fulfillment and understanding responses to conflict, and the only significant partner effect for relatedness needs was in predicting satisfaction.

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

need fulfillment and perceived conflict was stronger when one’s partner also experienced greater relatedness-need fulfillment,  $t(95.5) = -4.14, p < .0001, pr = -.39$ , relative to when one’s partner experienced less relatedness-need fulfillment,  $t(123) = -2.11, p < .05, pr = -.19$ . Thus, partners tended to perceive less

conflict in their relationship when both partners experienced greater relatedness-need fulfillment.

Finally, in predicting defensive responses to conflict, there was a significant Actor  $\times$  Partner interaction for relatedness-need fulfillment,  $t(62) = -2.12, p < .05, pr = -.26$ . Figure 3 provides

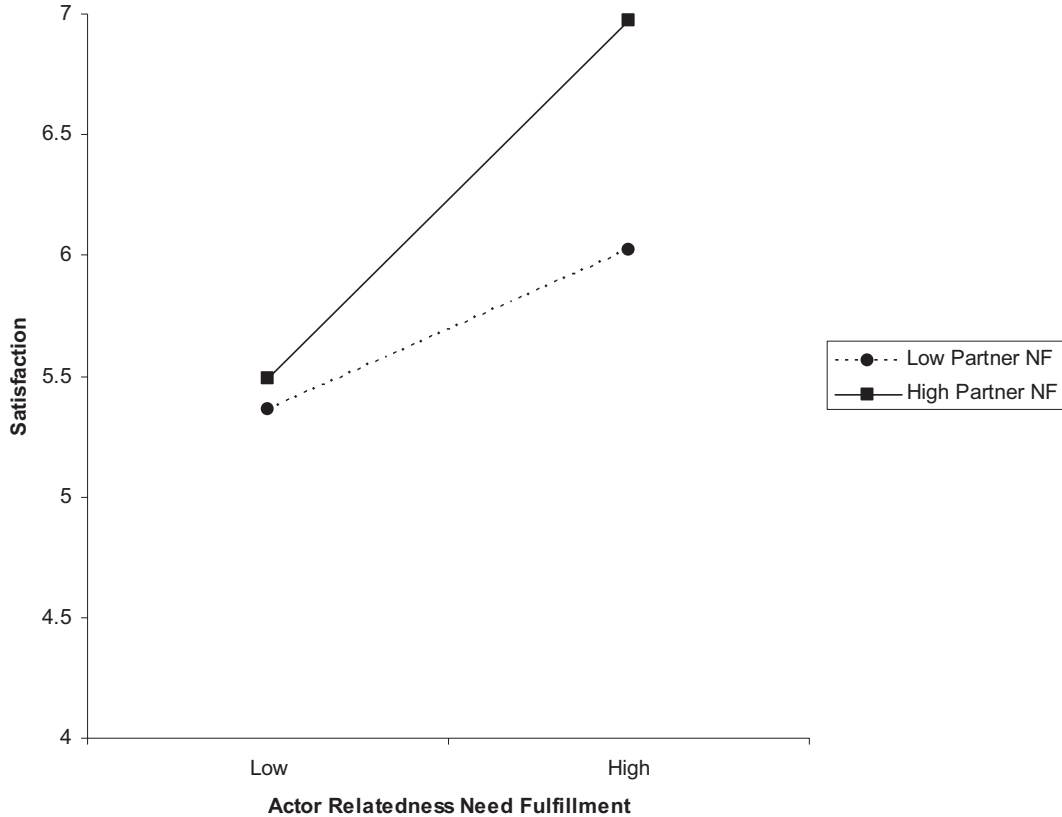


Figure 1. Actor  $\times$  Partner interaction for relatedness-need fulfillment (NF) predicting relationship satisfaction.

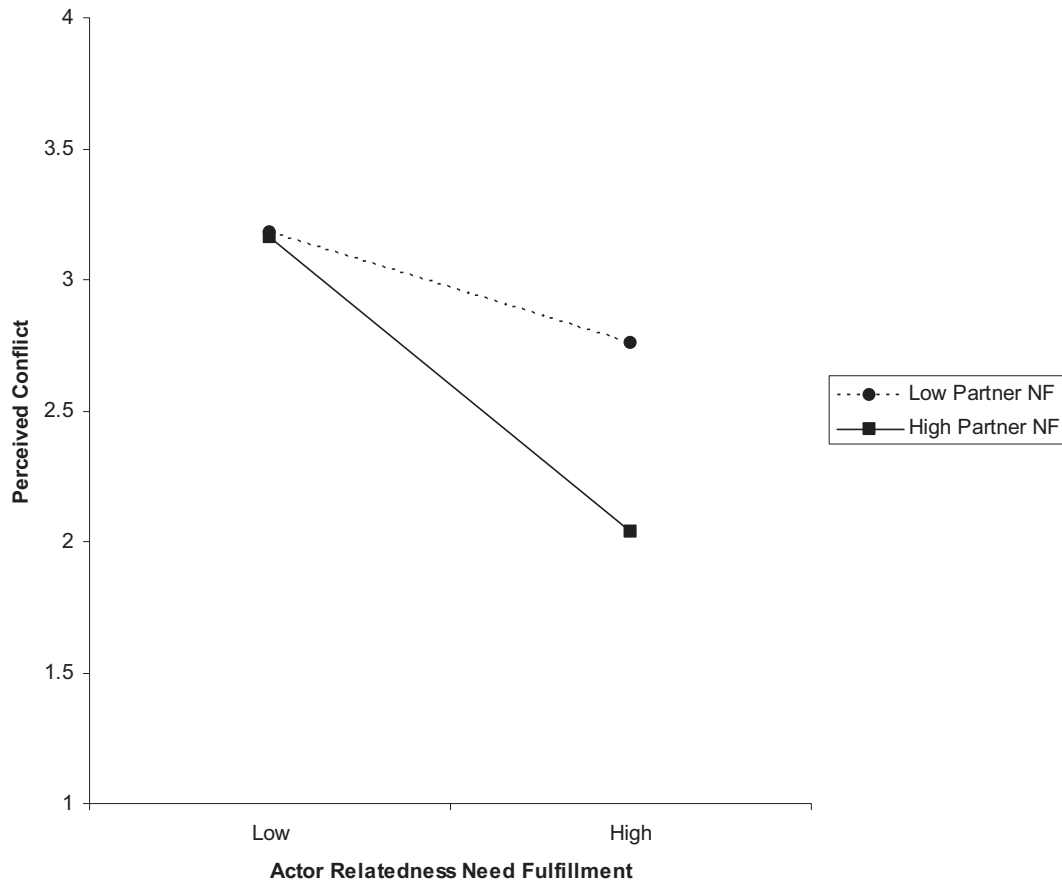


Figure 2. Actor  $\times$  Partner interaction for relatedness-need fulfillment (NF) predicting perceived conflict.

the simple regression lines of defensive responses as a function of actor relatedness-need fulfillment at high and low levels of partner relatedness-need fulfillment. As shown, tests of simple slopes revealed that the negative association between actor relatedness-need fulfillment and defensiveness was stronger when one's partner experienced greater relatedness-need fulfillment,  $t(101) = -5.68, p < .0001, pr = -.49$ , and was weaker when one's partner experienced less relatedness-need fulfillment,  $t(125) = -4.43, p < .0001, pr = -.37$ . Thus, partners tended to be particularly less defensive when both experienced greater relatedness-need fulfillment.

Given the conceptual similarity between relatedness-need fulfillment and perceived closeness, we were concerned that these findings could be accounted for by a tendency for individuals experiencing greater relatedness-need fulfillment to also perceive more closeness in their relationship. Indeed, for both men and women, relatedness-need fulfillment was significantly correlated with closeness ( $rs > .27, ps < .05$ ). The above analyses were thus repeated, controlling for the main effects of actor and partner perceived closeness as assessed by the IOS Scale (Aron et al., 1992). All main effects for the unique contribution of actor and partner relatedness-need fulfillment remained significant. In addition, and perhaps more important, the interaction between actor and partner perceived closeness did not account for the significant Actor  $\times$  Partner interactions for relatedness-need fulfillment.

Thus, relatedness-need fulfillment accounts for unique variance in these outcomes beyond what is accounted for by closeness.

There was also one significant Actor  $\times$  Partner interaction for competence needs in predicting understanding responses to conflict,  $t(62) = -1.99, p = .05, pr = -.25$ . Tests of simple slopes revealed that the positive association between actor competence-need fulfillment and understanding responses to conflict was significant when one's partner had lower feelings of competence-need fulfillment,  $t(79.7) = 2.11, p < .05, pr = .23$ , but not when one's partner had higher feelings of competence-need fulfillment,  $t(90.2) = -0.97, ns$ . This is an interesting finding, particularly in light of the fairly consistent pattern of results that emerged for relatedness needs, in which optimal outcomes emerged when both partners experienced greater need fulfillment. On the basis of this finding, it appears that, for competence needs, it is sufficient (indeed beneficial) for only one partner to feel that his or her needs are being met.

It is difficult to say why this might be. In examining the within-couple correlations, competence is the only need on which partners seem to be fairly independent ( $r = .06$ ). Thus, perceptions of competence may not be derived from the relationship in similar ways for both partners. Although all three needs carry with them at least some social component in that their fulfillment is in part a function of the social context, perhaps competence involves more self-focus or self-evaluation, and thus, in terms of one's own

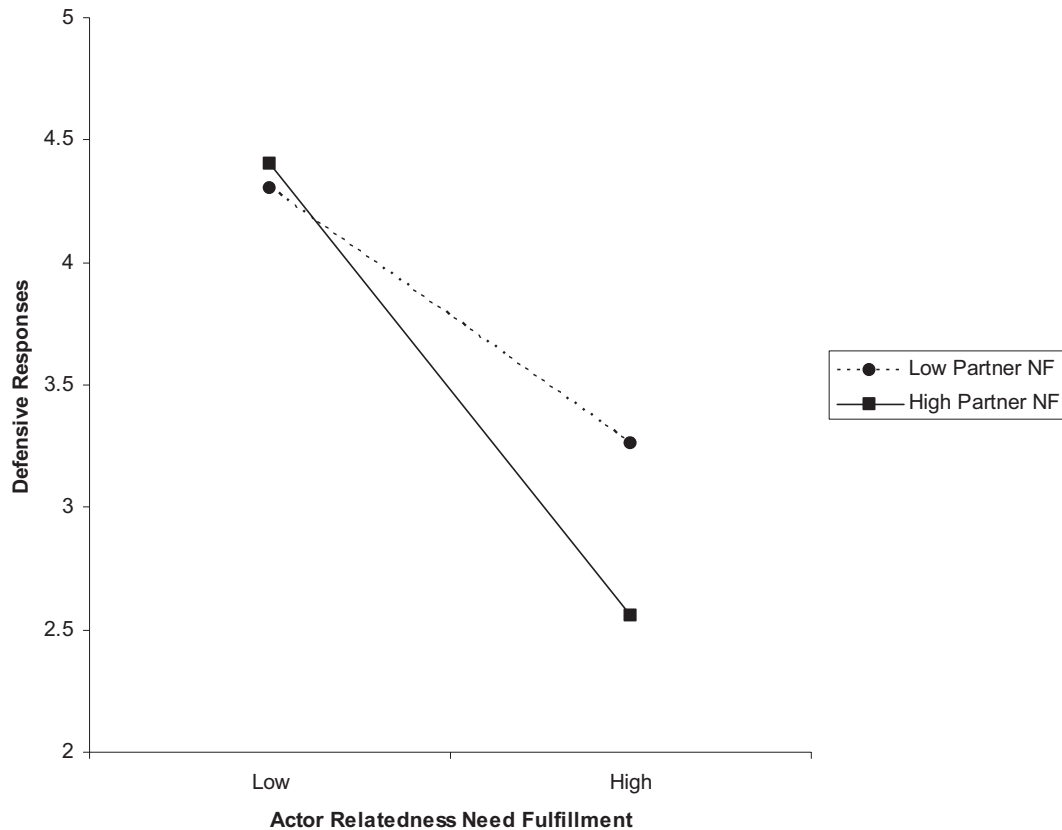


Figure 3. Actor  $\times$  Partner interaction for relatedness-need fulfillment (NF) predicting reported defensive responses to conflict.

outcomes, it may be beneficial for only oneself to experience satisfaction of this need. In contrast, because relatedness has to do with one's connection to others, it may be particularly important for both partners to experience a high degree of connection to experience optimal relationship functioning and well-being. Another possible explanation may have to do with the nature of the understanding responses to conflict variable. Perhaps feeling competent in one's relationship provides the efficacy needed to be able to respond to conflict in more constructive ways—by attempting to understand the conflict and one's partner better. Whether one's partner experiences this same sense of efficacy may thus have less impact on one's own experience of this dimension of relationship well-being.

Overall, findings from Study 2 illustrate the importance of both partners' need fulfillment in relationship functioning and well-being. We found evidence for the unique role of both actor and partner need fulfillment in predicting satisfaction, perceptions of conflict, and defensive responses to conflict. In addition, for relatedness-need fulfillment, we found evidence that relationships benefit more in terms of this same set of outcomes when both partners experience more relatedness. Thus, when both partners experience greater relatedness, the relationship may become more intrinsically rewarding. In light of the findings from La Guardia and colleagues (La Guardia et al., 2000), it may also be that when both partners experience greater relatedness, the relationship has a stronger, more secure base and partners are thus able to negotiate

the challenges that often arise within close relationships in ways that benefit the relationship as a whole, as well as the individuals who compose it.

### STUDY 3

Studies 1 and 2 were based on cross-sectional data and focused exclusively on reported responses to conflict and disagreements. In Study 3, we sought to extend these findings to examine the association between need fulfillment and relationship quality following disagreements in daily life. In addition, we sought to better explain the mechanism(s) through which need fulfillment is related to these outcomes. One mechanism through which need fulfillment may be related to relationship functioning and well-being is through its association with relationship motivation. Put another way, being in a relationship that provides the contextual support for one's needs for autonomy, competence, and relatedness may be associated with experiencing greater intrinsic motivation for being in the relationship, which in turn is associated with responding to relationship disagreements in more adaptive ways.

SDT assumes that people have an inherent tendency to move toward integration (i.e., assimilating one's goals, values, and behaviors into a coherent sense of self) and intrinsic motivation. Rather than assuming that these integrative tendencies are automatic, SDT takes a dialectical view and acknowledges that integrative processes depend on the contextual supports for basic

psychological needs (Deci & Ryan, 1991). Thus, need fulfillment is a prerequisite to optimal functioning. To the extent that an individual experiences greater need fulfillment, he or she will also experience greater intrinsic motivation. A growing body of research has found that intrinsic motivation is most likely to occur in circumstances that support autonomy, competence, and relatedness needs (Deci & Ryan, 1985; Ryan, 1995). Although much of the research on SDT has addressed general motivation orientations, the theory also specifies that contexts that support (or hinder) need fulfillment may also be more (or less) conducive to intrinsic motivation in that particular domain (Ryan, 1995). Intrinsic motivation in relationships has been shown to be associated with greater agreement between partners and greater relationship satisfaction (Blais et al., 1990) as well as both reported and observed responses to conflict and feelings of satisfaction (Knee et al., 2005). Previous research has thus demonstrated that need fulfillment is associated with more intrinsic motivation, and a separate body of research has demonstrated that being intrinsically motivated within one's relationship is associated with a range of positive relationship outcomes including dyadic functioning, satisfaction, and responses to conflict. However, research has not yet examined these processes simultaneously. These premises involving the link between need fulfillment and relationship motivation and the link between relationship motivation and positive relationship outcomes served as the basis for Study 3.

## Method

### *Participants*

Participants were 120 undergraduates in heterosexual romantic relationships lasting at least 1 month. The sample was ethnically diverse with 42% Caucasian, 28% Hispanic, 15% African-American, 8% Asian, and 7% who chose "Other." The sample consisted mostly of individuals in serious dating relationships, with most participants exclusively dating (49%), nearly engaged (28%), or engaged (5%) and with others casually dating (8%) or married (10%). The sample was biased toward women with 84% women ( $n = 101$ ) and 16% men ( $n = 19$ ). The average age of participants was 21.6 years old ( $SD = 3.5$  years). Participants had been in their current relationship between 1 month and over 14 years ( $M = 2.5$  years,  $SD = 2.3$  years).

### *Procedure*

Participants were first given a battery of questionnaires in a Latin square design to measure need fulfillment, relationship motivation, various demographics, and a variety of other constructs included for other purposes.<sup>3</sup> They were then given diary records to be completed after each disagreement over a period of 10 days. Disagreement was broadly defined as any interaction in which it was apparent to them that they and their partner disagreed. This definition was clarified by describing that a disagreement (a) involves at least some discussion (e.g., they and their partner talk about a difference of opinion); (b) involves a difference of opinion that includes some sort of interaction, even if for only a few seconds and even if only verbal (e.g., on the telephone); and (c) is not necessarily a major conflict or fight, because we were equally interested in everyday minor differences of opinion as well as

more serious disagreements. We chose to define disagreement in this way because we were primarily interested in examining people's responses to a range of conflicts experienced in relationships. Each diary record assessed the time and length of discussion, the time the record was completed, and satisfaction and commitment immediately following the disagreement. At the end of the 10-day period, participants completed a follow-up questionnaire to assess perceived accuracy of records.

## *Measures*

### *Need Fulfillment*

Perceived need fulfillment was assessed using the same measure described in Study 1. Internal reliabilities (Cronbach's  $\alpha$ ) in Study 3 were .87, .86, .71, .81, and .74 for overall need fulfillment, the autonomy-competence composite, autonomy, competence, and relatedness, respectively.

### *Relationship Motivation*

The Couple Motivation Questionnaire (Blais et al., 1990) was used to assess relationship motivation in the form of one's reasons for being in the relationship. The questionnaire begins with the stem "Why are you in the relationship?" Each of the 18 items then provides a reason for being in the relationship, and responses are indicated using a 1 (*Does not correspond at all*) to 7 (*Corresponds exactly*) scale. A simplex pattern was evident among the subscales such that those reflecting more autonomous or intrinsic reasons were more positively related to one another and those reflecting less intrinsic reasons were more positively related to one another. Further, subscales reflecting more autonomous reasons were negatively related to those reflecting less autonomous reasons. Consistent with Blais et al. (1990), an index of relationship motivation was computed by weighting the items according to where they fell on the relative autonomy continuum. (For further details on how the weights were derived, please see Blais et al., 1990.) Sample items are, "There is nothing motivating me to stay in my relationship with my partner" (weighted -3), "Because people who are important to me are proud of our relationship and I would not want to disappoint them" (weighted -2), "Because I would feel guilty if I separated from my partner" (weighted -1), "Because this is the person I have chosen to share life plans that are important to me" (weighted +1), "Because I value the way my relationship with my partner allows me to improve myself as a person" (weighted +2), and "Because I love the many fun and exciting times I share with my partner" (weighted +3). An overall index of relationship motivation was computed from the weighted subscales, with higher scores indicating more autonomous or intrinsic relationship motivation. Internal reliability (Cronbach's  $\alpha$ ) in this sample was .76.

<sup>3</sup> These data are part of a larger dataset on implicit theories of relationships. Portions of these data were described in Knee, Patrick, Viator, and Neighbors (2004). Those data were limited to implicit theories of relationships as moderators of how experienced conflict is associated with relationship quality. Other portions of these data were described in Knee et al. (2005). Those data were limited to the role of trait and relationship autonomy in relationship satisfaction.

IOS

As in Study 2, the IOS Scale (Aron et al., 1992) was included to assess perceived closeness.

Postdisagreement Satisfaction

Satisfaction after disagreement was assessed on each diary record using an abbreviated form of the QRI, adapted from the Quality of Marriage Index (Norton, 1983), as described in Study 1. Items were selected on the basis of their relevance to daily interactions and were modified with the phrase “right now.” The four satisfaction items were “Right now, my relationship with my partner is stable,” “Right now, our relationship is strong,” “Right now, my relationship with my partner makes me happy,” and “Right now, I really feel like part of a team with my partner.” These abbreviated diary items were averaged (on each record) such that higher scores reflected higher relationship satisfaction after disagreement. Internal reliability (Cronbach’s  $\alpha$ ) in this sample was .95.

Postdisagreement Commitment

Commitment after disagreement was assessed on each diary record using an abbreviated form of the Rusbult et al. (1991) measure described in Study 1. Three items were selected on the basis of their relevance to daily interactions and were modified with the phrase “right now.” The three commitment items were “Right now, for how much longer do you want your relationship to last?”, “Right now, do you feel committed to maintaining your relationship with your partner?”, and “Right now, do you feel attached to your relationship with your partner?” As with the abbreviated satisfaction measure, these abbreviated diary items were averaged (on each record) such that higher scores reflected higher commitment after disagreement. Internal reliability (Cronbach’s  $\alpha$ ) in this sample was .94.

Follow-Up Questionnaire

At the end of the 10-day period, participants completed a follow-up questionnaire designed to examine factors such as participant’s perceived accuracy, difficulty of the recording procedure, and how the diary recording procedure may have affected

interactions with their partner. Items were answered on a 7-point scale in which 1 is a low anchor (*not at all*) and 7 is a high anchor (*very much*). In addition, participants were asked to indicate how many hours per day they interacted with their partner, on average, over the diary-recording period.

Results and Discussion

Preliminary Analyses

Participants recorded 908 disagreements over the 10-day period, with an average of 5.43 per person. On average, disagreements lasted approximately 21 min ( $SD = 48$ ), and 140 min ( $SD = 184$ ) elapsed between the time that the disagreement occurred and the time that the diary record was completed. Participants did not feel it was especially difficult to record their disagreements ( $M = 2.75$ ,  $SD = 1.46$ ), felt their diary records were fairly accurate, ( $M = 5.71$ ,  $SD = 0.94$ ), estimated that they were able to record 88.46% of disagreements on average, felt that keeping records did not especially increase ( $M = 2.09$ ,  $SD = 1.39$ ) or decrease ( $M = 2.48$ ,  $SD = 1.55$ ) their tendency to have disagreements with their partner, and that, on average, they were with their partner 4–7 hr per day.

Preliminary analyses also examined whether need fulfillment was associated with the nature of events recorded. Overall need fulfillment was not significantly associated with number of disagreements recorded or discussion length ( $r_s < .17$ ). Those who had greater need fulfillment were less likely to have discussed the issue previously ( $r = -.33$ ,  $p < .001$ ) and were more likely to perceive that disagreements had been resolved ( $r = .28$ ,  $p < .01$ ). This same pattern of findings emerged for the autonomy–competence composite and for autonomy, competence, and relatedness needs individually.

Finally, before conducting multilevel modeling analyses, we examined the pattern of correlations among the various predictor and outcome variables. For each participant, aggregate postdisagreement satisfaction and postdisagreement commitment scores were computed by averaging across all events. Correlations among these variables and with the measures of need fulfillment and relationship motivation are provided in Table 6. As shown, there were strong positive correlations between each of the need fulfillment variables. Autonomy was significantly correlated with both

Table 6  
Study 3: Correlations Among Need Fulfillment, Relationship Motivation, and Aggregated Event Variables

Characteristic	1a	1b	1c	1d	2	3a	3b
1. Need fulfillment							
1a. Overall	—						
1b. Autonomy	.86***	—					
1c. Competence	.88***	.74***	—				
1d. Relatedness	.79***	.47***	.52***	—			
2. Relationship motivation	.62***	.43***	.45***	.70***	—		
3. Postdisagreement (aggregated)							
3a. Satisfaction	.42***	.30***	.30***	.46***	.51***	—	
3b. Commitment	.42***	.30***	.25***	.50***	.64***	.78***	—

Note.  $N_s$  ranged from 119 to 120 depending on completeness of data.  
\*\*  $p < .01$ . \*\*\*  $p < .001$ .

competence and relatedness, and relatedness and competence were also significantly correlated with each other. In addition, and more germane to the goals of Study 3, each of the need fulfillment variables was significantly and positively associated with the aggregated postdisagreement satisfaction and commitment variables. Each of the need fulfillment variables was also significantly and positively associated with relationship motivation. Relationship motivation was also significantly and positively associated with the aggregated postdisagreement satisfaction and commitment variables.

### *Analytic Strategy*

The structure of the data was such that disagreements were nested within persons. Level 1 variables were event variables (i.e., postdisagreement satisfaction and commitment on each diary record) and were nested within Level 2 person variables (i.e., need fulfillment, relationship motivation). All analyses for this study involved only Level 2 predictors. For a detailed description and examples of this approach using event-contingent diary data, see Nezlek (2001).

### *Need Satisfaction and Relationship Quality as a Function of Disagreements in Daily Life*

Need fulfillment was measured at the trait level, whereas postdisagreement satisfaction and commitment were each measured at the event level. The model for these analyses thus included the fixed effects for the intercept and the slope(s) for need fulfillment and one random effect for the intercept predicting postdisagreement satisfaction and commitment separately. Overall, need fulfillment significantly predicted postdisagreement satisfaction,  $F(1, 118) = 27.50, p < .0001, \beta = .42, pr = .43$ , and postdisagreement commitment,  $F(1, 118) = 24.64, p < .0001, \beta = .41, pr = .42$ . Thus, those who had greater need fulfillment felt more satisfied and more committed to their relationship after disagreements, relative to other participants. The above analyses were repeated, replacing overall need satisfaction with autonomy, competence, and relatedness subscales. Relatedness was the only unique predictor of postdisagreement satisfaction,  $F(1, 116) = 17.55, p < .0001, \beta = .39, pr = .36$ , and postdisagreement commitment,  $F(1, 116) = 24.55, p < .0001, \beta = .46, pr = .42$ . Results were the same when the autonomy–competence composite was used in place of the individual autonomy and competence subscales. Using the *Z* test procedure for nonindependent correlation coefficients (Meng et al., 1992), we compared the coefficients for autonomy versus relatedness–need fulfillment and for competence versus relatedness–need fulfillment. Once again, relatedness was the strongest predictor of both satisfaction (autonomy,  $Z = 1.80, p < .05$ ; competence,  $Z = 2.08, p < .05$ ) and commitment (autonomy,  $Z = 1.83, p < .05$ ; competence,  $Z = 2.12, p < .05$ ).

### *Path Analyses: The Role of Relationship Motivation*

We were also interested in examining the potential processes through which need fulfillment is related to postdisagreement relationship quality. On the basis of the conceptualization of need satisfaction as a precursor to more intrinsic regulation (Ryan, 1995), we hypothesized that the association between need fulfill-

ment and postdisagreement relationship quality may be due, in part, to the role that need fulfillment plays in facilitating intrinsic relationship motivation. Thus, we proposed a model whereby the association between need fulfillment and postdisagreement relationship quality was mediated by relationship motivation. In testing mediation, we followed Kenny, Kashy, and Bolger's (1998) criteria, which suggest mediation when (a) the predictor (need fulfillment) significantly predicts the criterion (postdisagreement satisfaction, commitment); (b) the predictor significantly predicts the mediator (relationship motivation); (c) the mediator significantly predicts the criterion controlling for the predictor; and (d) the association between the predictor and the criterion, controlling for the mediator, is substantially reduced or is zero. We further examined the magnitude of the reduction in Step 4 with a modified version of the Sobel test (Baron & Kenny, 1986). This modified formula includes the addition of the product of the standard errors of the relevant paths. Thus, a significant Sobel *z* suggests that the reduction in the association between the predictor (need fulfillment) and the criterion (postdisagreement satisfaction, commitment) with and without controlling for the mediator (relationship motivation) is reliable. Analyses were conducted for the overall need fulfillment score and for each of the need fulfillment subscales entered simultaneously. In addition, analyses were conducted separately for postdisagreement satisfaction and commitment. Thus, two sets of analyses were conducted for each postdisagreement outcome.

Need fulfillment and relationship motivation were measured at the trait level, whereas postdisagreement satisfaction and commitment were each measured at the event level. The model for Step 1 of the analyses thus included the fixed effects for the intercept and the slope(s) for need fulfillment and one random effect for the intercept predicting postdisagreement satisfaction and commitment, as described in the previous section. The model for Step 2 included the fixed effects for the intercept and the slope(s) for need fulfillment predicting relationship motivation and no random effects. The model for Steps 3 and 4 included the fixed effects for the intercept and the slopes for need fulfillment and relationship motivation and one random effect for the intercept.

### *Overall Need Fulfillment*

Figure 4 presents the path models that summarize the mediation analyses for overall need fulfillment. The top portion of the figure summarizes analyses for postdisagreement satisfaction, whereas the bottom portion of the figure summarizes analyses for postdisagreement commitment. Analyses proceeded according to the steps described above (Kenny et al., 1998). First, as described above, need fulfillment significantly predicted postdisagreement satisfaction and commitment such that those who had greater need fulfillment felt more satisfied and more committed to their relationship after disagreements, relative to other participants. Second, need fulfillment significantly predicted relationship motivation,  $F(1, 118) = 75.88, p < .0001, \beta = .62, pr = .63$ . Those who had greater need fulfillment were more intrinsically motivated to be in the relationship. Third, relationship motivation significantly predicted postdisagreement satisfaction,  $F(1, 116) = 19.84, p < .0001, \beta = .43, pr = .38$ , and postdisagreement commitment,  $F(1, 116) = 46.56, p < .0001, \beta = .57, pr = .54$ , when need fulfillment was included in the equation. Fourth, need fulfillment no longer



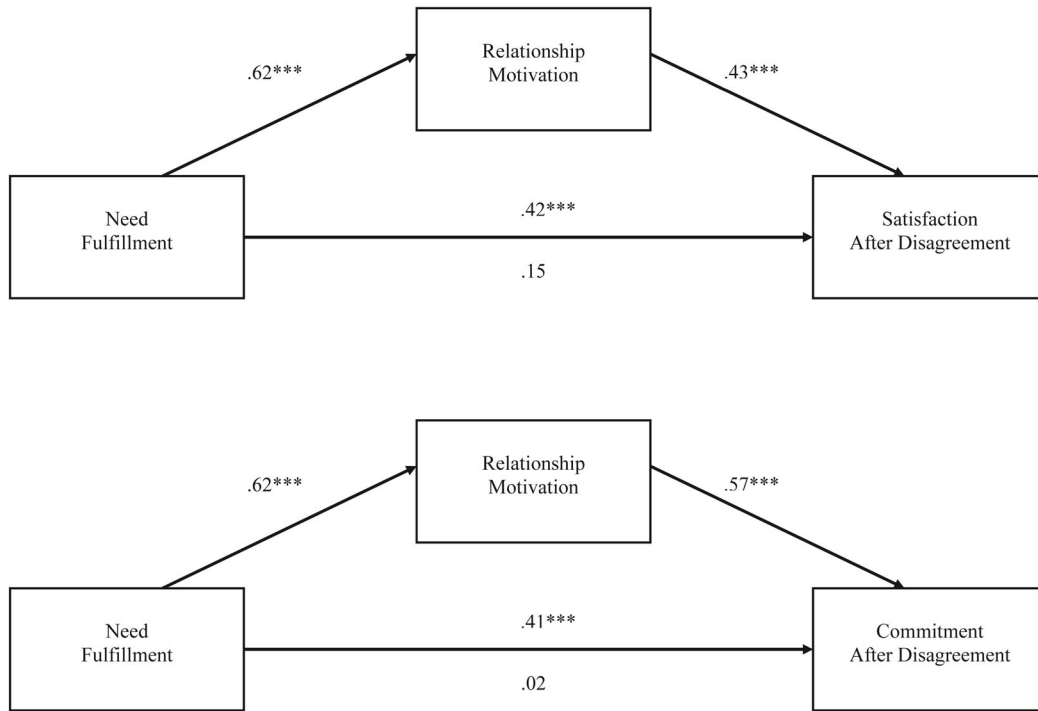


Figure 4. Mediation model for need fulfillment predicting postdisagreement satisfaction (a) and commitment (b). Path coefficients are standardized. \*\*\* $p < .001$ .

significantly predicted postdisagreement satisfaction and commitment after controlling for relationship motivation ( $ps > .10$ ). Finally, the magnitude of the reduction in how need fulfillment predicts postdisagreement satisfaction both with ( $\beta = .15$ ) and without ( $\beta = .42$ ) relationship motivation in the model was significant (Sobel  $z = 4.33$ ,  $p < .0001$ ). A similar pattern emerged with postdisagreement commitment such that the reduction in how need fulfillment predicts postdisagreement commitment both with ( $\beta = .02$ ) and without ( $\beta = .41$ ) relationship motivation in the model was significant (Sobel  $z = 6.26$ ,  $p < .0001$ ). As was the case in Studies 1 and 2, this pattern of findings also emerged when the autonomy and competence composite was used in place of overall need fulfillment. Thus, general support was found for the notion that people who have greater need fulfillment tend to feel more intrinsically motivated to be in the relationship and in turn feel more satisfied and more committed (relative to others) following disagreements.

### Need Fulfillment Subscales

The above analyses were repeated, replacing overall need fulfillment with autonomy, competence, and relatedness subscales. All three subscales were entered into the equation as simultaneous predictors. Table 7 provides the coefficients summarizing the mediation analyses testing the unique contribution of each need in predicting postdisagreement satisfaction and commitment. First, relatedness uniquely predicted postdisagreement satisfaction and commitment. Second, relatedness uniquely predicted relationship motivation. Third, after controlling for each of the three needs, relationship motivation significantly predicted postdisagreement

satisfaction and commitment. Fourth, none of the needs predicted postdisagreement satisfaction or commitment after we controlled for relationship motivation ( $ps > .17$ ). Finally, the magnitude of the reduction in how need fulfillment, specifically relatedness, predicts postdisagreement satisfaction both with ( $\beta = .15$ ) and without ( $\beta = .39$ ) relationship motivation in the model was significant (Sobel  $z = 3.58$ ,  $p < .0001$ ). A similar pattern emerged with postdisagreement commitment such that the reduction in how relatedness-need fulfillment predicts postdisagreement commitment both with ( $\beta = .10$ ) and without ( $\beta = .46$ ) relationship motivation in the model was significant (Sobel  $z = 6.03$ ,  $p < .0001$ ). Finally, as in Studies 1 and 2, analyses testing the unique contribution of each need to these outcomes were repeated, replacing the individual autonomy and competence subscales with a composite of the two. Predictors thus included the autonomy-competence composite and the relatedness-need fulfillment subscale. Results for the mediation analyses were the same as those reported above. These results suggest that, of the three needs, relatedness-need fulfillment may be particularly important in the context of romantic relationships. More specifically, those who experience more relatedness with their partner have more intrinsic reasons for being in the relationship, which, in turn, predicts better relationship well-being (relative to others) in terms of satisfaction and commitment after disagreements.

We attempted to address several alternative explanations that could account for these findings. First, as noted in the preliminary analyses section, there was a significant association between need fulfillment and perceived resolution of conflict. Thus, it could be argued that individuals with greater need fulfillment experienced

Table 7

*Study 3: Need Fulfillment and Relationship Motivation Predicting Postdisagreement Satisfaction and Commitment in Daily Life*

Characteristic	Satisfaction				Commitment			
	<i>B</i>	<i>SE B</i>	$\beta$	<i>pr</i>	<i>B</i>	<i>SE B</i>	$\beta$	<i>pr</i>
Step 1: Need fulfillment predicting postdisagreement								
Autonomy	0.12	0.16	.09	.07	0.28	0.22	.16	.12
Competence	0.05	0.17	.04	.03	-0.20	0.23	-.11	-.08
Relatedness	0.50	0.12	.39***	.36	0.80	0.16	.46***	.42
Step 2: Need fulfillment predicting relationship motivation								
Autonomy	1.06	1.12	.09	.09	1.06	1.12	.09	.09
Competence	0.65	1.18	.06	.05	0.65	1.18	.06	.05
Relatedness	6.83	0.84	.62***	.60	6.83	0.84	.62***	.60
Steps 3 and 4: Mediation								
Autonomy	0.08	0.15	.06	.05	0.20	0.19	.11	.10
Competence	0.01	0.16	.01	.00	-0.28	0.20	-.15	-.13
Relatedness	0.19	0.14	.15	.13	0.18	0.18	.10	.10
Relationship motivation	0.04	0.01	.34***	.33	0.09	0.01	.57***	.48

\*\*\*  $p < .001$ .

better postdisagreement relationship quality simply because of their tendency to believe that the conflict had been resolved. In addition, there was a significant association between need fulfillment and being less likely to have discussed the issue previously. Thus, a case could be made that the issues discussed by participants with greater need fulfillment were less serious or less threatening as they were less likely to discuss issues that had come up repeatedly in their relationship. To address these alternative explanations, we repeated all of the above analyses, controlling for these two variables. Results were unchanged.

Other possible alternative explanations have to do with the method used and the broader experience involved with the recording procedure. First, those who experienced greater need fulfillment may have had fewer disagreements or may have been less likely to record their disagreements, and thus they were more likely to remain satisfied and committed. It was also possible that those who experienced greater need fulfillment had shorter and presumably less involved or less serious disagreements and that this was related to postdisagreement satisfaction and commitment. Preliminary analyses suggested no statistically significant association between need fulfillment and these two variables. Nonetheless, all of the analyses were repeated, controlling for these two variables, and all results remained. As noted in the preliminary analyses section, there was considerable lag between the time that events occurred and the time that they were reported ( $M = 140$  min), and there was also substantial variation in the amount of time that passed between the time that events occurred and the time that they were recorded ( $SD = 184$  min; hereafter referred to as "lapse"). It is possible that those who experienced greater need fulfillment may have had different lapses between event occurrence and event recording. It is also possible that the results reported differed on the basis of the amount of time that had passed between the time of event occurrence and the time of event recording. Thus, we repeated the Study 3 analyses, controlling for

lapse as a covariate and (separately) testing the moderating effect of lapse. Results remained unchanged when controlling for lapse. There were only two significant interactions with lapse: relationship motivation by lapse predicting postdisagreement satisfaction,  $t(765) = -2.43, p < .05, pr = -.09$ , and commitment,  $t(770) = -2.05, p < .05, pr = -.07$ . Tests of simple slopes revealed that the association between relationship motivation and postdisagreement satisfaction was somewhat stronger when less time had passed between event occurrence and event recording,  $t(116) = 5.09, p < .0001, pr = .43$ , relative to when more time had passed,  $t(116) = 4.05, p < .0001, pr = .35$ . The same pattern emerged in predicting postdisagreement commitment.

Finally, as in Study 2, we were also interested in testing whether the findings for the unique role of relatedness needs in this mediation model could be accounted for by perceived closeness. Thus, closeness, as assessed by the IOS Scale (Aron et al., 1992), was included in each step of the analyses. Results were unchanged, providing further evidence of the unique role of relatedness-need fulfillment in predicting relationship motivation and, subsequently, more adaptive responses to relationship conflicts.

## GENERAL DISCUSSION

Together, the findings from these three studies highlight the importance of need fulfillment in relationship functioning and well-being and the particular relevance of relatedness to these outcomes. In each study, overall need fulfillment and each individual need were associated with various aspects of relationship functioning and well-being. However, when each need was entered into the equation simultaneously (Studies 1 and 3), relatedness consistently emerged as the strongest and, in many cases, as the only unique predictor of these outcomes. Study 1 found that need fulfillment was associated with greater individual well-being (i.e., higher self-esteem, more positive affect, less negative affect, more

vitality), more secure attachment (i.e., less avoidant and less anxious), better relationship quality (i.e., higher satisfaction and commitment), less perceived conflict, and more adaptive responses to conflict (i.e., more understanding and less defensive). In examining the unique contribution of each need to these outcomes, a consistent pattern emerged suggesting that, although each of the needs contributed in different ways to indicators of individual well-being, relatedness was the strongest unique predictor of relationship functioning and well-being.

In Study 2, we included a sample of couples and examined how each partner's need fulfillment contributes to relationship outcomes. The findings of Study 2 suggest that the benefits of need fulfillment, specifically as they pertain to relationship functioning and well-being, are not limited to one's own need fulfillment but carry over to one's partner as well. For overall need fulfillment as well as for competence and autonomy needs, there were significant actor and partner effects in predicting satisfaction, perceived conflict, and defensive responses to conflict. For relatedness, actor need fulfillment predicted satisfaction, commitment, perceived conflict, understanding responses to conflict, and defensive responses to conflict; the only significant partner effect was in predicting satisfaction. More important, analyses involving the combination of partners' need fulfillment (i.e., Actor  $\times$  Partner interactions) showed that when both partners experienced greater relatedness-need fulfillment, they experienced greater relationship satisfaction, perceived less conflict, and reported less defensive responses to conflict. Thus, when both partners experienced greater relatedness-need fulfillment, they experienced better relationship functioning and well-being.

The findings of Study 2 are particularly interesting when considering both theoretical conjecture and empirical evidence within the broader SDT framework regarding the benefits of both giving and receiving autonomy support (Deci et al., 2006). Theoretically, the benefits of autonomy support have been assumed to accumulate because giving and receiving autonomy support helps to meet one's basic psychological needs. Recent research has confirmed this theoretical supposition and has demonstrated that, among close friends, perceiving autonomy support within the relationship was associated with better relationship quality, including greater perceived need fulfillment. More important, the extent to which there was mutuality in perceived autonomy support—that is, the extent to which an individual perceived both that he or she and his or her friend experienced autonomy support from the friendship—accounted for much of the variance in the association between perceived autonomy support and relationship quality. The current Study 2 extends these findings to consider both partners' need fulfillment—a benefit of autonomy support—in relationship functioning and well-being. In Study 2, we examined perceived need fulfillment from the perspective of both partners and demonstrated a pattern of findings consistent with the findings of Deci et al. (2006). When both partners experienced greater need fulfillment from their partner (particularly greater fulfillment of their need for relatedness), individuals experienced better relationships in terms of greater satisfaction, less perceived conflict, and less defensive responses to conflict.

In Study 3, we sought to examine the mechanisms through which need fulfillment contributes to relationship functioning and well-being and incorporated a diary procedure in which participants recorded every disagreement they had with their partner over

a 10-day period. Thus, we examined the role of need fulfillment in responses to conflict in daily life, as indicated by postdisagreement satisfaction and commitment. More important, in Study 3, we tested a mediation model to further examine the process by which need fulfillment is associated with relationship well-being. Results showed that individuals who had greater need fulfillment had more autonomous or intrinsic reasons for being in their relationship (which were in turn associated with higher satisfaction and commitment after disagreements) relative to other participants. When autonomy, competence, and relatedness needs were entered into the equation simultaneously, relatedness once again emerged as the strongest predictor of these outcomes.

The mediation model tested in Study 3, especially the association between need fulfillment and intrinsic relationship motivation, is particularly interesting in light of much of the theorizing and research dealing with the association between intrinsic motivation and relatedness. Traditionally, autonomy and competence needs have been shown to be the most powerful influences on intrinsic motivation. However, SDT hypothesizes that secure relatedness is needed for intrinsic motivation to flourish (Ryan & La Guardia, 2000), and there is some evidence to suggest that relatedness supports integration and intrinsic motivation. For example, when students perceive their teachers as warm and caring, they evidence greater intrinsic motivation toward academics (Ryan & Grolnick, 1986; Ryan et al., 1994). In the current research, relatedness was the strongest predictor of intrinsic relationship motivation. Thus, although there may be some situations in which relatedness is less central to intrinsic motivation, it appears that, in the context of close relationships and relationship motivation, relatedness may be particularly important.

Several other theories in the literature on close relationships have addressed many of the issues raised here such as the dynamics of motivations and filling needs in relationships. For example, self-expansion theory (Aron & Aron, 1996; Aron, Aron, Tudor, & Nelson, 1991) states that people are motivated to expand their resources, perspectives, and characteristics by including the other person within the self. In relation to SDT, a few points are worth noting. First, self-expansion and the sense of closeness that derives from "including another within one's self" seem to be largely about SDT's need for relatedness. However, self-expansion theory does not explicitly address needs for autonomy and competence. Further, although in the current set of findings relatedness and closeness (as indicated by a measure of including the other in the self) were moderately correlated, relatedness provided a unique contribution to the outcomes of interest across studies. This suggests that, although relatedness and self-expansion have some conceptual similarity, the relatedness need identified by SDT includes additional aspects of closeness and intimacy not tapped by including the other in the self. Second, to these authors' knowledge, self-expansion theory does not discuss different qualities of self-expansion, whereas SDT explicitly acknowledges and discusses healthier, more adaptive ways to expand the self via its notion of the continuum of integration (and the continuum of extrinsic to intrinsic motivations for expanding the self). In other words, self-expansion theory suggests that people are motivated to expand their resources, perspectives, and characteristics but does not distinguish more intrinsic versus more extrinsic reasons for doing so. Perhaps not all motivations for relating and expanding one's self are equal. Seeking closeness from a partner to acquire

resources (e.g., fame, approval from others, monetary gains) could be a different form of motivation than seeking to learn new perspectives and grow. This may be particularly important in light of the mediation model presented in Study 3, which demonstrated that one of the reasons that need fulfillment is associated with better postdisagreement relationship quality (relative to others) is because need fulfillment is associated with being more intrinsically motivated to be in the relationship. Thus, in the context of romantic relationships, feeling that one's partner meets one's relatedness needs is beneficial primarily because it may facilitate an intrinsic motivation for being in the relationship. As mentioned previously, intrinsic relationship motivation has been associated with a variety of positive relationship outcomes (Blais et al., 1990; Knee et al., 2005, 2002). Thus, although SDT in general and the relatedness need in particular are consistent with the notion of self-expansion, the SDT perspective goes beyond what has been proposed by self-expansion theory to suggest that some ways of seeking self-expansion may lead to more authentic and profound forms of self-expansion and relatedness than others.

Interdependence theory (Kelley & Thibaut, 1978) offers another perspective from which to consider the current set of findings. Interdependence theory describes how outcomes are negotiated within the interpersonal structure of dyadic situations. According to this perspective, individuals are motivated to maximize personal and relational rewards within the context of relationship decisions and behaviors. In so doing, partners transform the decisions that they would initially make (and ways that they would initially behave) that do not consider the partner's desires into different ways of deciding and behaving that do take into account the partner's desires. As with self-expansion theory, interdependence as a concept seems most fundamentally about the need for relatedness, although it could also be argued that interdependence is really about the negotiation between individual outcomes and relational outcomes. However, it is important to note that individual interests and motivations in interdependence theory are not equivalent to SDT's notion of autonomy (as described previously in the introduction). The SDT conceptualization of autonomy is not the same as selfishly pursuing one's own interests.

Much of the more recent research involving interdependence and the transformation of motivation in close relationships has focused on two prorelationship behaviors: accommodation (choosing not to retaliate in the face of a partner's transgression) and willingness to sacrifice (foregoing one's own immediate interests to promote the well-being of one's partner or relationship). Prorelationship behaviors have been associated with dyadic adjustment and with a greater probability of couple persistence (Van Lange et al., 1997), and when partners perceive prorelationship behaviors, they come to trust each other and rely on the relationship more (Weiselquist, Rusbult, Foster, & Agnew, 1999). Interdependence theory in general and the focus on prorelationship behaviors in particular do not acknowledge the possibility that not all transformation of motivation or reasons for enacting prorelationship behaviors are equal. SDT contends that one's reasons for being in the relationship and one's reasons for engaging in prorelationship behaviors have important implications for how beneficial these behaviors may be, both for the relationship as a whole as well as for the individuals who compose it. It may be particularly beneficial to the relationship and partner when people engage in these behaviors because they truly want to and not simply to avoid

an argument or to gain the approval of one's partner. Reasons for enacting prorelationship behaviors may also impact how these behaviors are perceived by one's partner. If one's partner perceives that one is enacting these behaviors to "make points" or to gain something from the partner, prorelationship behaviors may not be as beneficial to the relationship, as they are perceived as being motivated by one's own interests and not by one's focus on the partner or the relationship. In addition, the SDT perspective would suggest that, to the extent that one's autonomy, competence, and relatedness needs are fulfilled, it would be easier and more natural to take one's partner and the relationship into account and behave more interdependently.

Communal-exchange perspectives (Mills & Clark, 2001) distinguish between a communal orientation and an exchange orientation. The former carries the expectation of immediate repayment for benefits given. The latter concerns the expectation of mutual responsiveness to the others' needs more generally and with a more long-term sense of equity. The motivation implied within the communal-exchange framework is important and relates to SDT in that an exchange orientation could seem more likely to go along with extrinsic motivation, whereas a communal orientation could seem more likely to go along with intrinsic motivation. Thus, when one is expecting relatively immediate "repayment" from one's partner, one is in the mindset of behaving for those more immediate reciprocal rewards rather than out of true interest in developing the relationship and enjoying it for its own sake. Similarly, when one is motivated to be responsive to the partner's needs in a more long-term fashion, one seems more motivated by appreciation and genuine desire to relate rather than by guilt or obligation. As mentioned above with reference to interdependence theory, when one's psychological needs are fulfilled, it may be easier and more natural to behave out of a communal orientation. Further, a communal orientation would seem to promote trust and a deeper sense of intimacy and relatedness. It would seem difficult to be truly responsive to a partner's needs if one felt that one was being forced to do so out of guilt, obligation, or expected repayment (lack of autonomy fulfillment); if one felt incompetent or inadequate in the relationship (lack of competence fulfillment); or if one felt disconnected from one's partner or felt as if one's partner did not understand something important about oneself (lack of relatedness fulfillment).

Reis, Clark, and Holmes (2004) proposed "partner responsiveness" as an important overarching concept in the study of personal relationships in general and in closeness and intimacy within those relationships in particular. According to Reis et al. (2004), partner responsiveness is a process by which people come to believe that their romantic partner is attentive to and supportive of core elements of the self and, through this process, partners become closer or more intimate. It is important to note that partner responsiveness may occur as a result of somewhat objective behavioral responses (e.g., social responses of one partner to another that communicate that the partner understands and values the other's needs, often assessed through observational research; Gottman, 1979, 1994) and more subjective perceptions of a partner's attentiveness to one's needs. This concept of partner responsiveness is evident in each of the perspectives outlined above, and the notion of partner responsiveness is particularly relevant to need fulfillment in close relationships and the current set of findings. Consistent with an extensive body of research—both within the close relationships

literature in general (see Stroebe & Stroebe, 1996, for review) and within the SDT literature in particular (see Deci & Ryan, 2000, for review)—the current studies point to the importance of perceiving support from one's social network for greater well-being. The current research focused specifically on the importance of having one's psychological needs met in the context of one's romantic relationship and found that the extent to which one perceived that one's needs were being fulfilled by one's partner determined a feeling of greater (or lesser) relationship functioning and well-being. Study 2 spoke to this issue more directly, as it focused on perceived need fulfillment among both partners and on how each partner's need fulfillment contributes to one's own relationship functioning and well-being as well as on how the combination of partner's need fulfillment contributes to substantially greater relationship functioning and well-being. One of the unique contributions of Study 2 is its focus on both partners' perceptions of how responsive the other was to fulfilling one's psychological needs. Study 2 demonstrated that, although perceiving that one's partner was meeting one's own needs predicted important outcomes for oneself, one's partner's perceptions that those needs were being met also uniquely predicted these outcomes for oneself. This is one of the key characteristics of close relationships and is perhaps one of the more interesting indicators of partner connectedness: That one's partner's perceptions can impact how one feels about one's relationship. In addition, Study 2 demonstrated that relationships benefit even more from both partners feeling that the other is responsive to his or her needs, particularly the need for relatedness. Although most relationship research focuses on individual perceptions, the current Study 2 emphasized the importance of perceived need fulfillment from both members of the dyad, thus contributing to our broader understanding of how both partner's perceptions of the other's responsiveness contribute to relationship functioning and well-being. In addition, Study 3 further expanded our understanding of why partner responsiveness to one's needs is so beneficial by highlighting one mechanism through which such responsiveness benefits relationships: Need fulfillment increases intrinsic relationship motivation.

In the current set of studies, it is also important to keep the findings regarding relatedness in perspective. Study 1 illustrated the role of each of the needs in individual well-being but also demonstrated that relatedness was the strongest unique predictor of relationship functioning and well-being. In addition, results for overall need fulfillment were not simply a function of relatedness needs. Across all three studies, secondary analyses revealed that results for overall need fulfillment and those for a composite consisting of only autonomy and competence needs were the same. Thus, these results were not simply driven by the role of relatedness needs in relationship outcomes. In Studies 2 and 3, we were able to test the unique role of relatedness-need fulfillment relative to that of perceived closeness in the relationship. Because relatedness needs involve feeling connected to and understood by others, there is obvious conceptual overlap with relationship closeness. In Study 2, we found that, when controlling for actor and partner perceived relationship closeness, all actor and partner main effects remained significant. More important, the interaction between actor and partner perceived closeness did not account for the significant Actor  $\times$  Partner interactions for relatedness-need fulfillment, which predicted satisfaction, perceived conflict, and defensiveness. Thus, relatedness-need fulfillment contributes

uniquely to relationship functioning and well-being independent of the role of perceived closeness in these outcomes.

The present studies used a variety of methods and data analytic approaches to examine how need fulfillment is associated with relationship functioning and well-being. These studies are, of course, not without limitations. First, need fulfillment was not assessed longitudinally in any of the studies. Previous research has suggested that daily need fulfillment is associated with daily fluctuations in well-being (Reis et al., 2000; Sheldon et al., 1996). Although this previous research has focused on individual indicators of well-being, it may very well be that daily fluctuations in need fulfillment are also associated with daily fluctuations in relationship well-being such that individuals experience better "relationship days" on days when they experience greater need fulfillment in their relationship. Future research is needed to examine this question. Another limitation is that Studies 1 and 3 were composed primarily of women. Study 2 included heterosexual couples and thus equal numbers of men and women, which alleviates this concern somewhat, but additional research is needed to enhance the generalizability of the findings.<sup>4</sup> Another potential limitation to these studies is that all data were collected on college students, who may not be representative of other adult relationships. However, at least in terms of relationship length, the participants in these studies were in relatively stable, long-term relationships for college student samples. Nonetheless, it is important for future research to examine these processes in nonstudent samples. In addition, all measures used in these studies were based on self-report, so there is no indication of how fulfillment of these needs translates into behavior within one's relationship, particularly in terms of responding to conflict. Finally, all of the studies were correlational, thus precluding causal inferences about the role of need fulfillment in these outcomes.

Despite these limitations, the present set of studies adds to our understanding of the importance of need fulfillment not only as it pertains to optimal individual functioning but also as it pertains to optimal relationship functioning. Because need fulfillment is largely a function of the social context, studying need fulfillment within specific relationships and studying how such need fulfillment is associated with relationship experiences may help us to develop a clearer conceptualization of the ways in which needs are

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<sup>4</sup> Across the eight samples used for Study 1 analyses, there were nearly 400 men. We thus repeated analyses for this study using only the men in the samples. In the first set of analyses involving the meta-analytically combined correlations between need fulfillment and indicators of individual and relationship well-being, results were the same as those reported for the full sample. In the second set of analyses involving the meta-analytically combined *prs* between need fulfillment and these outcomes, results were largely the same for relatedness-need fulfillment (with the exception of a nonsignificant *pr* for negative affect). However, results for autonomy and competence needs were somewhat different. Notably, for men, there were no significant associations between autonomy and negative affect, avoidant attachment, anxious attachment, satisfaction, commitment, and defensive responses to conflict. Regarding competence, there were no significant associations for positive affect, satisfaction, perceived conflict, and understanding responses to conflict. However, there was a significant *pr* between competence and commitment that did not emerge for the full sample.

fulfilled and of how these needs contribute to optimal human functioning in a variety of contexts.

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## Appendix

Study 1: Range of Partial Correlations and Standard Error of the Means

Characteristic	<i>k</i>	<i>N</i>	Autonomy		Competence		Relatedness	
			<i>pr</i>	<i>SE</i>	<i>pr</i>	<i>SE</i>	<i>pr</i>	<i>SE</i>
Individual well-being								
Self-esteem	8	1,918	-.02 to .20	.03	.13 to .50	.03	-.08 to .10	.03
Positive affect	4	955	-.04 to .03	.04	.15 to .27	.04	.10 to .39	.04
Negative affect	4	955	-.30 to .10	.04	-.03 to -.40	.04	-.05 to -.24	.04
Vitality	2	484	-.02 to .01	.06	.14 to .20	.06	.14 to .23	.05
Attachment								
Avoidant	4	1,345	-.06 to -.19	.03	-.03 to .01	.03	-.25 to -.49	.03
Anxious	4	1,345	-.01 to -.26	.03	-.05 to -.21	.03	-.16 to -.25	.03
Relationship well-being								
Relationship quality								
Satisfaction	8	1,918	-.03 to .16	.03	-.01 to .19	.03	.37 to .70	.03
Commitment	7	1,561	-.17 to .11	.03	-.17 to .29	.03	.13 to .86	.03
Perceived conflict	5	1,354	-.03 to -.33	.04	-.16 to .00	.03	-.24 to -.38	.03
Responses to conflict								
Understanding	5	1,467	.01 to .09	.03	-.10 to .20	.03	.08 to .33	.03
Defensive	5	1,467	-.30 to .02	.04	-.03 to -.18	.04	-.06 to -.26	.03

Note. *k* = number of samples; *N* = total number of observations; *pr* = partial correlation coefficient.

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