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Social support, mood, and relationship satisfaction at the trait and social levels

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SOCIAL SUPPORT, MOOD, AND RELATIONSHIP SATISFACTION AT THE
TRAIT AND SOCIAL LEVELS

by

J Austin Williamson

A thesis submitted in partial fulfillment of the requirements for the Doctor of Philosophy
degree in Psychology in the Graduate College of The University of Iowa

August 2015

Thesis Supervisor: Professor Michael W. O'Hara

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Graduate College
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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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has been approved by the Examining Committee for the thesis requirement for the Doctor of Philosophy degree in Psychology at the August 2015 graduation.

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student has been fascinating, challenging, profound, and demanding. I am very glad to have had help along the way.

ABSTRACT

Many social processes influence the amount, quality, and availability of support from an individual's social network. *Trait influences* are characteristics of the individual that generalize across relationships and affect how much support is received and perceived on average from other people. *Social influences* comprise characteristics of the individual's social network. They are relationship specific and account for the variability in supportiveness among an individual's providers. Recent studies have taken a multilevel approach to studying social support in order to partition the variance in sets of relationship-specific support measures into trait and social components. These studies have also used multivariate generalizability (G) theory to examine the correlations between social support and other constructs, such as negative mood, at the trait and social level.

These multilevel studies have begun to clarify the relative contributions of *trait* and *social* influences on social support, but much is yet to be learned about the nature and measurement of social support's trait and social components. One set of aims within this project was to identify characteristics of support recipients and characteristics of support providers that were related to the reception and perception of social support. Another set of aims focused on validating the measurement strategies used by G theory researchers and understanding how the trait and social components of support and mood derived from relationship-specific measures relate to traditional measures of these constructs. My final set of aims involved the application of multilevel analyses of social support and negative mood to three existing theories in the social support literature—the buffering hypothesis, the matching hypothesis, and the platinum rule.

The participants in this study comprised two samples—one group of 755 undergraduate psychology students, and one group of 430 community members from across the United States. Participants completed measures of their personality traits, recent depressive symptoms, recent experiences of life adversity and perceived control

over life adversity. They also reported on three close relationships including support from those relationships, satisfaction with those relationships, and mood experienced when interacting with those three people.

Several multilevel analyses were used in the study. Univariate G theory analyses were used to quantify the relative variance in support, mood, and relationship satisfaction attributable to trait and social influences. Multivariate G theory analyses were used to estimate the links between these variables at the *trait* and *social* levels of analysis. Mixed effects models were used to identify trait and relationship-specific constructs that that might partly constitute the trait and social influences on social support. Multilevel Structural Equation Modeling (SEM) was used to evaluate the validity of several constructs employed in previous multilevel studies on social support. Finally, mixed effects and multivariate G theory analyses were used to test the buffering hypothesis, the matching hypothesis, and the platinum rule.

Consistent with previous multilevel studies of social support, recipients who received more support, on average, from their social networks also reported more negative mood when interacting with their providers. After taking those average tendencies into account, the amount of support received from an individual support provider was not associated with negative mood experienced when with that provider. The investigation of the trait influences on social support showed that recipients who were younger, more extraverted, and more open to new experiences tended to receive more social support. Women tended to receive more support than men. With respect to social influences, romantic partners tended to provide the most support whereas friends and siblings provided significantly less support on average. Women tended to provide more support than men. The validity assessment showed that the social component of support availability was only modestly distinct from the social component of generic relationship satisfaction. The trait component of support availability showed good discriminant validity from relationship satisfaction and good convergent validity with

global support availability. The trait component of relationship-specific mood showed moderate convergent validity with general mood. The buffering and matching hypotheses were not supported by my findings. The platinum rule was supported at the trait level in that recipients who reported greater support adequacy, on average, tended to report more positive mood and less negative mood. The platinum rule was also supported at the social level in that recipients tended to report experiencing the most positive mood and least negative mood when interacting with individual providers who tended to supply the most adequate support.

PUBLIC ABSTRACT

The amount of social support any one person receives is influenced by characteristics of that person, characteristics of the people in that person's support network, and characteristics of the unique relationships between all of them. In this study, I found that women received more support than men and that recipients who were younger, more extraverted, and more open to new experiences also received more support. Individuals got more support from their romantic partners and less from their family and friends. Regardless of relationship type, female support providers tended to give more support than male providers. I also found that individuals who received more support overall tended to experience more positive mood and that they experienced the most positive mood with the people who provided the most support.

Individuals who received the most social support also experienced more negative mood. Part of the reason more social support was associated with more negative mood was that individuals who got more support than they wanted experienced more negative mood. Individuals who received less support than they wanted also experienced more negative mood.

The implications of this study are that individuals who want more social support should speak openly, spend time with others frequently, and seek opportunities for cultural engagement and new experiences regularly. They should also seek out or maintain a romantic relationship and cultivate relationships with female support providers. Support providers should learn the preferences of those they help regarding how much of certain types of support those recipients would like.

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CHAPTER I

Introduction

Investigators have long been interested in whether and how the encouragement, advice, comfort, and assistance individuals receive from those close to them are related to the recipient's mood. Related questions concern reasons why some relationships provide more of what is collectively referred to as 'social support' than others. In recent years, researchers have begun to apply multilevel designs to the study of social support. When participants report on support from multiple providers, multilevel analyses can be used to partition the variance in participants' responses into trait and social components. This strategy has begun to shed new light on some old questions in the social support literature, and has opened the door for important advancements in the field. The current study was designed to address three related sets of aims. First, previous multilevel investigations have estimated the relative proportions of the overall variability in social support that are attributable to characteristics of the support recipient versus characteristics of the recipient's support providers. This study sought to explore *what* characteristics of providers and recipients might be associated with increased support. Second, multilevel studies on social support have essentially created new constructs by breaking up the variance in the constructs of interest into trait and social components. This study was the first to assess the validity of some of those new constructs. Third, previous multilevel studies have examined only bivariate correlations between support and mood. This study applied the multilevel approach to three alternative models of social support—the buffering hypothesis, the matching hypothesis, and the platinum rule.

Social Support as a Meta-construct

One of the defining characteristics of social support is that this term is best construed as a "meta-construct" (Vaux, Phillips, Holly, Thompson, Williams, & Stewart, 1986, p.196) and a variety of sub-constructs have been proffered as facets of the social world that hold some potential for benefitting the individual. For the purposes of this

study, the most important sub-construct distinction is that between received social support and perceived social support. Received support comprises instances of supportive behavior that the individual has experienced at some time in the past (Barrera, 1986). Although the two terms are sometimes used interchangeably, *received* support differs from *enacted* support in that enacted support subsumes any support behavior provided to the individual by a member of his/her social network whereas received support consists of only those behaviors *noticed and remembered* by the recipient (Brock & Lawrence, 2010a). Importantly, provider accounts of enacted support are moderately to highly correlated with recipient accounts of received support (Antonucci & Israel, 1986; Cohen, Lakey, Tiell, & Neely, 2005), validating received support as an accurate reflection of the individual's social environment.

Whereas received support constitutes *instances* of supportive behavior, perceived support involves *judgments* made by the individual about some quality of their social network. In practice, perceived support is often measured in terms of the support the individual believes to be available, should support be needed. It may also be measured as the degree to which the individual is satisfied with the support that is usually received. Previous studies have shown that support availability and support satisfaction are substantially correlated but not identical constructs (I. G. Sarason, B. R. Sarason, Shearin, & Pierce, 1987). As to the correlation between perceived support and received support, a meta-analysis (Haber, Cohen, Lucas, & Baltes, 2007) found that received and perceived support were correlated $r = .35$ after correction for measurement error. The two appear to be related but clearly different constructs. Although both received support and perceived support are ultimately cognitive constructs (received support must be recognized and remembered), perceived support is generally regarded as more subjective in nature (Barrera, 1986).

Trait and Social Influences on Social Support

Important to the understanding of received social support and perceived social support and the differences between the two, is the recognition that these constructs are determined by characteristics of the individual as well as characteristics of the individual's social network. Traditionally, investigators have sought to quantify the trait and social components of social support by measuring aspects of the individual (e.g., personality, attachment style, etc.) and aspects of the social environment (e.g., through observation or others' reports) and evaluating the associations of these measures with scores on social support indices (e.g., I. G. Sarason, B. R. Sarason, & Shearin, 1986). More recently, generalizability theory (Brennan, 2001a; Cronbach, Gleser, Nanda, & Rajaratnam, 1972) and the social relations model (SRM; Kenny, 1994; Kenny, Kashy, & Cook, 2006) have been used to partition the variance in social support assessments into trait and social components.

The social relations model. For any construct that is transacted through social interaction or social cognitive processes (e.g., support, conflict, attachment, etc.) the social relations model (SRM) can divide the influences on that construct into "actor," "partner," and "relationship" components. In using the SRM for research on social support specifically, Lakey and Orehek (2011) have adopted the term "trait" to refer to actor effects and the term "recipient" when actor effects pertain to social support specifically. They also use "provider" to refer to partner effects, and "social" to refer to the combined influences of provider and relationship effects.

Trait influences comprise an individual's general tendency to acquire and perceive support from other people. Trait influences are, therefore, characteristics of the individual that are manifested relatively consistently across relationships. Conversely, the effects of social influences on the support an individual receives/perceives vary from provider to provider. If trait influences account for why Jane receives a higher average level of support from her social network than John, social influences account for why

Jane receives more support from Sarah than she does from Jill. The provider component of the social influences is determined by the tendency of support providers to be more or less supportive to other people in general. For instance, Sarah may be more supportive of Jane than Jill because Sarah is customarily a nice, kind, supportive person. The relational component of the social influences is determined by the unique relationship between the individual and a given provider. Sarah may be unsupportive of most people but give Jane more support than she gives others (and more support than Jane usually gets) because of something unique in Jane and Sarah's relationship.

Generalizability theory. The variance components that compose the SRM (trait, provider, and relationship) can be estimated using generalizability (G) theory. G theory was developed by Cronbach and colleagues (1972) as a means of estimating the influence of different sources of error on a set of observed scores. Take a case where a group of raters scored a set of essays on the New Deal. G theory might be used to estimate variance in these scores attributable to the latent characteristic of interest (knowledge of the New Deal) as well as error variance attributable to the essay raters, error variance attributable to the individual grading criteria for each essay, and the possible interactions between individuals, raters, and essays. In G theory approaches to social support, three sources of variance are regarded as substantive (not error) influences on social support—trait, provider, and relationship effects.

In the vast majority of studies on social support, investigators have used *global* support instruments that measure support from the recipient's entire social network. An item on a global support instrument would ask about a given type of support and how much of that support had been received (or was available) in total, from everyone the recipient knew. The studies used to estimate the SRM components are different in that participants must report on interactions from multiple specific providers. Provider and relational influences can be separated through research designs (e.g., Lakey, Lutz, & Scoboria, 2004) in which recipients all rate the same providers (e.g., Jane, John, and Ben

all rate Paul, Jane, and Sarah as providers). For these designs, providers are ‘crossed with’ recipients because each recipient rates each provider. Conversely, provider and relational influences cannot be separated when recipients each rate a different group of providers (e.g., Lakey, Orehek, Hain, & VanVleet, 2010). In these cases, provider and relational influences are referred to collectively as social influences. Because each recipient rates a different group of providers, providers are ‘nested within’ recipients in these designs. Nested designs are more common in the social support literature because they permit the measurement of recipients most important support providers (who are unlikely to be the same providers for each participant in the study).

Trait components. Both received support and perceived support are influenced by characteristics of the individual. Generalizability studies by Lakey et al. (2010) suggest that trait effects account for 42-46% of the variance in received support. With respect to perceived support, the existing studies have all examined support availability, specifically, and estimates for the proportion of variance accounted for by trait effects usually range from 10-25% (e.g., Branje, van Aken, & van Lieshout, 2002; Lemay & Clark, 2008; Lakey & Scoboria, 2005). These findings indicate substantive consistency across support providers for both received support and support availability and provide clear evidence for a trait component of both constructs.

Additional evidence for the importance of trait influences comes from studies on the stability of social support. If support is influenced by relatively enduring characteristics of the individual, one would expect support to be consistent over time. The field’s dominant measure of received support, the Inventory of Socially Supportive Behaviors (ISSB; Barrera, Sandler, & Ramsay, 1981), has demonstrated excellent 2-day test-retest reliability ($r = .88$, Barrera et al., 1981), but estimates of its long-term stability are more modest (6-month retest $r = .57$, Cheng, 1999). Conversely, perceived support appears to be as stable as many personality traits. For instance, Sherborne and Stewart (2001) found a one-year stability coefficient of $r = .78$ for support availability. I. G.

Sarason et al. (1986) found three-year stability coefficients of $r = .67$ for support availability and $r = .55$ for support satisfaction. When compared side by side with trait anxiety, Roos and Cohen (1987) found that the 8-week test-retest stability for support availability ($r = .80$) and trait anxiety ($r = .84$) were very similar. Another study (Dubois, Burk-Braxton, Swenson, Tevendale, Lockerd, & Moran, 2002) found that the 6-month test-retest stability for support availability ($r = .64$) and self-esteem ($r = .60$) were also much alike. Of course, stability may not be due exclusively to trait factors. Because generalizability studies have not yet been conducted over substantial time intervals, it is not yet clear whether the stability in these support constructs is due to stability in personal characteristics or stability in the makeup of social networks.

Intrapersonal trait components. The individual characteristics relevant to social support may be divided into intrapersonal and interpersonal categories. The intrapersonal components of social support comprise individual differences in social cognitive processes including how people interpret, evaluate, and remember interpersonal exchanges. Intrapersonal features have been particularly emphasized in the study of *perceived* support, partly out of a concern that perceived support largely reflects positive or negative biases in the processing of social information. For instance, Lakey and Cassady (1990) found that perceived support availability was more strongly related to dysfunctional attitudes and self-esteem than to received support. They also observed that individuals low in perceived support tended to interpret controlled social stimuli more negatively than individuals high in perceived support and that those low in perceived support were also less likely to remember social behaviors they initially appraised as helpful (though these findings did not replicate in Lakey, Moineau, & Drew, 1992). From their findings, Lakey and Cassady (1990) concluded that perceptions of support availability are determined more by individual differences in cognitive processes rather than individual differences in recent experiences with support figures. Cutrona, Hessline, and Suhr (1997) also observed a connection between perceived support and social biases.

They found that the personality trait of negative affectivity (Eysenck & Eysenck, 1964) was related to lower ratings of support satisfaction among spouses in a laboratory interaction task. This finding held after controlling for observer counts of the number of supportive behaviors and negative behaviors directed toward the recipient.

Many other studies have observed significant associations between negative affectivity (i.e., neuroticism; Watson & Clark, 1984) and perceived support (e.g., Broja, Callahan, & Rambo, 2009; Hart & Hope, 2004; Swickert, Hittner, & Foster, 2010). Investigators have observed correlations between perceived support and a number of other personality traits as well. In general, higher levels of socially desirable personality traits are associated with positive perceptions of social support. Individuals who report more extraversion (Asendorpf & van Aken, 2003) and optimism (Symister & Friend, 2003) report greater perceptions of support as do individuals who report more agreeableness (Branje, van Lieshout, & van Aken, 2004) and conscientiousness (Swicket et al., 2010). Individuals who have higher levels of self-esteem (Gracia & Herrero, 2004) and a generally positive view of themselves also are likely to report more perceived support (B. R. Sarason et al., 1991). Notably, the Big Five personality traits are associated with future levels of perceived support, even after controlling for current support; self-esteem is not (Asendorf & van Aken, 2003).

Other investigators who have emphasized the trait-like qualities of perceived support have likened perceived support to attachment style (Moreira et al., 2003; Ptacek, 1996; Sarason, Pierce, & Sarason, 1990). Bowlby (1982) described attachment in terms of “internal working models” that comprise the individual’s understanding of the social world and his or her place in it. Bowlby asserted that early experiences have a profound and enduring influence on one’s belief that other people will be responsive when help is needed. Therefore, attachment theory would suggest that beliefs about the supportiveness of one’s current social network are heavily influenced by one’s beliefs about other people in general. As attachment theorists have predicted, insecurely attached individuals appear

to perceive less support than do those who are securely attached, even when the amount and quality of the support provided are experimentally controlled (Collins & Feeney, 2004). Additionally, individuals high in perceived support are more likely to report that their parents were affectionate, interested, and empathic while raising them than are individuals low in perceived support (I. G. Sarason, et al. 1986). Furthermore, individuals who report high levels of perceived support tend to believe that other people are more agreeable in general (Branje, van Lieshout, & van Aken, 2005) and more supportive of everyone (B. R. Sarason, Pierce, Shearin, Sarason, Waltz, & Poppe, 1991). In a study in which support and attachment were measured simultaneously, perceived support was more strongly correlated with attachment than it was with received support (Kelly, Zuroff, Leybman, & Gilbert, 2012). However, although global perceived support and global attachment style are correlated, the correlations observed between them are generally not strong enough to suggest that the two constructs are equivalent ($r_s = .01 - .63$; e.g., Gallo, Smith, & Ruiz, 2003; Ognibene & Collins, 1998).

Two multilevel studies on attachment style also have contributed to the understanding of the link between perceived support and attachment style. Unlike support availability which generally shows at least a modest trait component, Lakey and his colleagues have found very low estimates for the trait components of interpersonal attachment (Barry, Lakey, & Orehek, 2007; Merlo & Lakey, 2007). In fact, the absence of a substantial trait component calls into question the validity of attachment *styles* that are purported to generalize across relationships. Barry et al. (2007) also found that support availability and avoidant attachment were very highly correlated ($r = -.87$) at the social level, meaning that individuals were more securely attached to those providers from whom they perceived support was most easily available. A correlation of $r = -.87$ is high enough to suggest that support availability and avoidant attachment are equivalent constructs at the social level, but the Barry et al. (2007) sample consisted of only 54 undergraduate students, calling into question the generalizability of their findings.

Interpersonal trait components. The trait-like characteristics of social support may be partly explained by individual styles of cognitive processing, but may also be attributable to consistent and enduring patterns of interacting with the social world. Recipient behavior during social interactions clearly influences the support received (Pasch, Bradbury, & Davila, 1997) and some individuals may, on average, elicit more and better support from their networks than others. Several findings suggest that those who report high levels of perceived support may interact with the social world differently than their peers. For instance, not only do individuals who endorse high perceived support report having a positive view of their own social competence (Bowling, Beehr, Johnson, Semmer, Hendricks, & Webster, 2004), but they tend to be viewed positively by their friends and family members as well (B. R. Sarason, et al., 1991). Laboratory studies have demonstrated that subjects who report more perceived support are rated as more competent leaders and problem solvers by trained observers (I. G. Sarason, et al., 1986) and are rated as more socially competent by fellow subjects (I. G. Sarason, Levine, Basham, & Sarason, 1983) and trained raters (B. R. Sarason, Sarason, Hacker, & Basham, 1985).

Although personality traits may influence social cognitive processing (as proposed above) such traits may also influence social behaviors that evoke or discourage support from others. Received support does not appear to be associated with neuroticism (Hammond, Banks, & Mattis, 2006; Ingram, Betz, Mindes, Schmitt, & Grant Smith 2001; Jang, Haley, Mortimer, & Small, 2003), but it does show positive correlations with extraversion (Swickert, Rosentreter, Hittner, & Mushrush, 2002) and agreeableness (Knoll, Burkert, & Schwarzer, 2006). Such correlations suggest that individuals who are particularly assertive or gregarious may be likely to ask for or elicit help from their social network or that those who are particularly gracious in receiving support may be more likely to receive support in the future. Extraverts also tend to have broader social networks and more confidants (Stokes, 1985; Swickert et al., 2002) which may promote

the acquisition of support as well. Conversely, shyness and social anxiety are negatively correlated with receptions of social support, with the caveat that fears of negative evaluation appear to be associated with increased reception of informational support (Caldwell & Reinhart, 1988).

Gender may also contribute to trait-level variance in the reception of social support. On average, women have larger and more intimate social networks (Belle, 1987) and report receiving more social support (Stokes & Levin, 1986; Wohlgemuth & Betz, 1991). Perceived support also tends to be higher among women (Kendler, Myers, & Prescott, 2005). Other studies have found that femininity (among both women and men) is associated with an increased tendency to seek and receive social support (Ashton & Fuehrer; Reevy & Maslach, 2001).

Social components. As noted above, individual traits do not appear to account for all of the variance in social support—received or perceived. Multilevel studies in which participants document support from the same providers (fully crossed designs) are able to partition the social component of support into provider and relationship effects. The findings of such studies will be reviewed below. However, the most important support providers for one subject are rarely the same as those for the other participants in the same study. Consequently, investigations conducted outside the laboratory often use nested designs in which each participant reports on a unique set of providers. Because each provider is associated with a single recipient, provider and relational effects cannot be separated in these designs; the combined influence of provider and relational factor is referred to as the social effects. Most nested designs have yielded estimates of 60-75% for variance in perceived support accounted for by social effects (Lakey et al., 2010; Lakey & Tanner 2012; Lakey & Scoboria, 2005). The two multilevel studies on received support conducted by Lakey et al. (2010) found that 47-53% was attributable to social effects.

Support provider characteristics. Although no fully crossed multilevel studies have been conducted on received social support, several studies on support availability suggest that 5-20% of its variance is due to provider influences (Lakey et al., 2004; Lakey, Drew, & Sirl, 1999; Veenstra et al., 2011). The significant provider effects observed in these studies indicate that some people tend to provide more and better support than others. Much like the findings relevant to interpersonal trait effects, the evidence on providers suggests that socially desirable characteristics are associated with greater support provision. Extraversion (Bowling, Beehr, & Swader, 2005) and agreeableness (Branje et al., 2005) are associated with increased support provision, as is trait empathy (Trobst, Collins, & Embree, 1994). Conversely, neuroticism and psychological distress are associated with provision of less support (Hinnen, Hagedoom, Sanderman, & Ranchor, 2007). Avoidant attachment (Feeney & Collins, 2001) and anxious attachment (Collins & Feeney, 2000) are also associated with diminished support provision.

Facility with certain social skills also seems to promote support provision. Verhofstadt, Ickes, and Buysse (2010) found that spouses differed in their ability to infer the unexpressed thoughts and feelings of their partners (what Verhofstadt et al. call *empathic accuracy*) and that spouses who were more accurate tended to provide more support. Individuals who value taking others' perspectives (Devoldre, Davis, Verhofstadt, & Buysse, 2010) and who believe that they are insightful and competent providers (Feeney & Collins, 2001) are also likely to offer more support.

Finally, as with trait effects, there appear to be significant gender differences relevant to support provision. Some studies suggest that women, on average, provide more support than men (Luszczynska, Gerstorf, Boehmer, Knoll, & Schwarzer, 2007) whereas others do not (Pasch et al., 1997; Roberts & Greenberg, 2002). Additional evidence suggests that women may provide support that is more emotionally sensitive (MacGeorge, Gillihan, Samter, & Clark, 2003). For these and likely other reasons, both

men and women tend to rely more on female support providers (Flaherty & Richman, 1989).

Relationship characteristics. As outlined above, there are both recipient and provider characteristics that are associated with increased quantity of and satisfaction with social support. However, the unique relationships individuals have with each of the other people in their social networks appear to account for 20-60% of the variance in support availability (Lakey, Ross, Butler, & Bentley, 1996; Lakey et al., 2004; Lemay & Clark, 2008). For example, Sandy's sarcastic sense of humor may be off-putting to most of her peers, but Sarah, who shares a similar personality, may find Sandy's perspective comforting when she is feeling out of sorts. Jack's neediness may drive away most of his friends, but may elicit extra support from John who is normally shy and reluctant to talk much with others.

Empirical identification of these sorts of matches has been limited to date, but some examples are available. For instance, Cohan, Booth, and Granger (2003) observed that husbands were offered more support by their wives when the husband's circulating testosterone was low and the wife's testosterone was high. In contrast, wives were offered more support when both spouses had low testosterone. McNulty, Neff, and Karney (2008) found that husbands and wives were both more supportive among couples in which observers rated the wife as the more attractive member of the pair and less supportive when the husband was rated as more attractive. Additionally, although several of the above-referenced studies identify personality traits that seem to dispose people to be more supportive, there appears to be some significant variance in the traits individual perceivers look for when judging how supportive another person is likely to be. For instance, Lutz and Lakey (2001) found that perceivers high in neuroticism were likely to view highly agreeable people as more supportive whereas perceivers lower in neuroticism were likely to view less agreeable people as more supportive.

Certain relationship characteristics are also associated with the level of support derived from those relationships. Relationship satisfaction is positively correlated with both received and perceived support, though its association with perceived support is substantially stronger (Kaul & Lakey, 2003). Relationship intimacy is also positively correlated with perceptions of support (Hobfoll & Lerman, 1989) and greater interdependence and trust are associated with more support provision (Feeney & Collins, 2001). Relationships in which the recipient (Lakey, et al., 1996) and provider (Lakey, Adams, Neely, Rhodes, Lutz, & Sielky, 2002) perceive the other as similar to themselves in personality are also more supportive.

Finally, certain types of relationships may be more supportive, on average, than others. One study found that traffic enforcement agents perceived that more support was available from their friends and family than from their co-workers (Baruch-Feldman, Brondolo, Ben-Dayana, & Schwartz, 2002). Another study found that spouses provided more available support than coworkers and friends/family (Dean, Kolody, & Wood, 1990). A corroborating study also found that women with chronic illnesses perceived more available support from their romantic partners than from their family members or friends (Primono, Yates, & Woods, 1990). Consistent with these studies on perceived support, Friedman (1993) showed that individuals report higher levels of received support from romantic partners as well.

Potential contributions from multilevel designs. The studies reviewed above on the correlates of the trait and social components of social support have relied largely on global support measures. Items on measures such as these pertain to the recipient's entire social network and thus the variance in these measures cannot be separated into trait and social components. Global support measures are, in essence, measures of trait level social support that are affected to an unknown degree by social influences. A global support measure can be used to identify, for instance, to what degree extraversion is associated with the reception of social support. However, only a set of relationship specific

measures can be used to estimate the extent to which extraversion can account for variance in trait-level tendencies to receive more support. Such an exploration could lead to important advancements in understanding the trait component of social support.

Another limitation of the existing literature pertinent to the putative trait and social influences on social support is that those studies rarely report more than bivariate correlations or simple between group comparisons. Multilevel modeling offers the opportunity to incorporate multiple predictors, at both the trait and social levels, into the same model; the effects of one predictor can then be isolated from the effects of related predictors. For instance, previous studies have found that women tend to both give and receive more support, but it is not known whether these effects operated independently (or perhaps partially independently). It is possible that women tend to receive more support because they are more active in seeking it out or more gracious in accepting it. It is also possible that women receive more support simply because they tend to have more female friends who tend to give support more frequently. As another alternative, women may tend to give more support simply because their friends, who tend to be female, request it more often. These and related possibilities can only be explored through multivariate models.

Environmental Influences on Social Support

In the generalizability literature to date, trait influences on social support have been treated as characteristics of the individual. However, there is some evidence to suggest that trait influences might also comprise characteristics of the individual's environment. Several lines of research provide evidence that individuals receive increased support following the experience of a severe event (Haines, Hurlbert, & Beggs, 1996; Norris & Kaniasty, 1996). *Perceived* stress is also positively associated with support reception (Dunkel-Schetter, Folkman, & Lazarus, 1987). Providers, too, express greater willingness to help when they perceive that the potential recipient has a high need (Regan & Gutierrez, 2005) and romantic partners provide more support when their

partner's stressors are readily apparent (Iida, Seidman, Shrout, Fujita, & Bolger, 2008). Given the evidence on adversity and received support, it is important to examine the extent to which individuals' tendencies to receive support are correlated with their recent life experiences.

Unlike received support, perceived support appears to be negatively associated with life adversity (Norris & Kanisaty, 1996). Some researchers have speculated that this inverse association is observed because perceiving high amounts of support promotes behaviors that help individuals to avoid stressful events; this is the *stress prevention* model (Dignam, Barrera, & West, 1986). Others have proposed that unmet needs associated with experience of adversity may call into question the perceived availability or effectiveness of support; this is the *support deterioration* model (Dean & Ensel, 1982; Lin & Dean, 1984; Lin & Ensel, 1984). Cross-sectional studies using multilevel modeling cannot clarify the causal nature of this association. However, multilevel modeling does make it possible to quantify the association between trait-level perceived support and life adversity.

Issues of Construct Validity in Previous Multilevel Studies on Social Support

In a multilevel study, a construct such as received support is actually two constructs. Trait-level received support is the recipient's average tendency to get more or less support from all of the providers in that recipient's network; social-level received support is the tendency for some providers within the network of one recipient to provide that recipient with more or less support than the other providers. Other constructs included in these multilevel studies (e.g., support availability, mood) may be broken down in a similar manner. Because the constructs used in a multilevel study are decomposed in this manner, it cannot be assumed that the validity demonstrated for the instruments used to measure those constructs would hold true in the multilevel context.

The existing multilevel support studies do provide some support for the validity of the constructs under examination. For instance internal consistency can be computed for

the trait¹ and social² levels separately; and received support, support availability, positive mood, and negative mood have all demonstrated good internal consistency at the trait and social levels. Multilevel support and mood have also demonstrated concurrent validity through expected associations with each other (e.g., Lakey & Scoboria, 2005; Lakey et al., 2010) and with other constructs such as attachment style (Barry et al., 2007), self-esteem (Lakey & Scoboria, 2005) and automatic negative thoughts (Lakey & Tanner, 2012). Missing from the current body of literature is evidence for the convergent and discriminant validity of social support and mood at the trait and social levels.

Support availability. As reviewed above, the discriminant validity of global measures of perceived support has frequently been called into question. Perceived support measures ask respondents to make subjective and sometimes hypothetical judgments about their interactions with support providers. It is possible, therefore, that these judgments are based less on the supportive nature of the respondents' relationships and more on something generic such as how well they like their providers. Kaul and Lakey (2003) have shown that relationship-specific support availability and relationship satisfaction are positively correlated—they measured only one relationship per recipient, however, so multilevel analyses were not possible. A multilevel analysis on support availability and relationship satisfaction would indicate whether these constructs are distinct at the trait level, social level, or both.

It is also possible to measure the convergent validity of relationship-specific support availability at the trait level as it would be expected that the correlation between global support availability and trait-level relationship specific support availability would be quite high. Given the enormous body of literature on global perceived support, it would be useful to know whether global support availability and trait-level relationship specific availability represent the same construct. Davis, Morris, and Kraus (1998) found that global perceived support and relationship-specific support show a different pattern of

correlations with loneliness and attachment. Their's was not a multilevel study, however, and they were not able to generate a trait component of relationship-specific support.

Mood. In order to utilize the multivariate generalizability framework, Lakey and colleagues (2005, 2010, 2011) have measured mood in terms of the positive and negative mood the recipient typically experiences when the recipient is with a given support figure. Questionnaires completed in these studies ask participants to indicate how often they feel various mood states (e.g., distressed, irritable, excited, attentive, etc.) when interacting with a specific person. The drawback to this approach is that it is not clear whether the trait component of these ratings reflects the individual's general mood (particularly in the absence of social interaction). Lakey et al. have routinely interpreted the trait component of relationship-specific mood as indicative of the support recipient's general mood, with a particular interest in how their findings might apply to the effects of social support on depression. However, an individual may experience relatively little negative mood when interacting with key support figures, but feel generally depressed if time spent with such people is limited. Someone who is distressed by social situations may experience little positive mood with others, even key support figures, but may find a great deal of pleasure in hobbies and other non-social activities. The degree to which the trait components of relationship-specific positive and negative mood are correlated with global measures of mood would indicate the degree to which those constructs are equivalent.

Alternative Models of Social Support and Mood

Researchers have long been interested in whether more social support leads to more positive mood and less negative mood (e.g., Miller, Ingham, & Davidson, 1976). The relevant literature to date has shown that the association between social support and negative mood depends greatly on whether the support being measured is received or perceived. Corrected meta-analytic estimates (Williamson, 2012) show that individuals who perceive more support report fewer depressive symptoms ($r = -.33$) whereas

received support and depression are not related ($r = -.03$). The null findings for received support are somewhat perplexing given that laboratory studies show that experimentally controlled support improves subjects' mood (Ditzen, Schmidt, Strauss, Nater, Ehlert, & Heinrichs, 2008; Heinrichs, Baumgartner, Kirschbaum, Ehlert, 2003) and intervention studies show that support groups can ameliorate depressive symptoms (Pfeiffer, Heisler, Piette, Rogers, & Valenstein, 2011).

Multilevel studies by Lakey et al. (2010) have added a further layer of complexity to this apparent paradox. Whereas perceived support is negatively associated with negative mood at both the trait and social levels, received support is positively associated with negative mood at the trait level and negatively associated with negative mood at the social level. This means that individuals who tend to receive more support across their relationships also tend to experience more negative mood. However, after accounting for these general tendencies, recipients report less negative mood when they are with providers who offer more support. Lakey et al. (2010) note that the trait and social components of received support are of roughly equal magnitude, as are the opposing correlations with negative mood associated with each component. These findings offer a promising explanation for the nonsignificant association between received support and depression at the global level but raise additional questions about opposing processes connecting received support and depression at the trait and social levels.

Multivariate generalizability theory. The particular multilevel analyses utilized by Lakey et al. (2010) were multivariate G theory analyses. These procedures incorporate two variables. In the case of Lakey et al. (2010), each support recipient rated both received support and negative mood for three separate providers. For all of these ratings collectively, there is a certain amount of covariance between received support and negative mood. In the same way that the variability in received support can be broken into variance components corresponding to the trait and social levels of analysis, the covariance between support and mood also can be broken into covariance components

corresponding to those same levels. The covariance component for the trait level represents the extent to which a recipient's tendency to receive support is related to the recipient's tendency to experience negative mood while interacting with support figures. The covariance component for the social level represents the extent to which, after controlling for the trait effect, recipients experiences of negative mood with a specific provider are related to the amount of support they get from that same provider.

The extant literature on the association between support and mood at the trait and social levels has thus far focused only on the simple linear associations between amount of support (received or perceived) and severity of negative mood. This type of association is what social support researchers refer to as the *main effects* model (Cohen & Wills, 1985). Although none of the alternative models found in the social support literature have yet gained wide acceptance or a clear and convincing empirical foundation, several offer promising hypotheses that may be examined through generalizability theory.

The buffering hypothesis. Reviewed by Cohen and Wills in 1985, the buffering hypothesis predicts that social support will be most beneficial during periods of elevated life stress. Social support is proposed to function primarily through protective processes, preventing those who are well supported from experiencing severe mood disturbances when they are faced with negative life events. Conversely, social support is posited to be relatively less important in the absence of substantial stressors. Depending on the focus of the study, either social support or life adversity may be thought of as a moderator of the other variable's association with psychological distress. Where the association between support and distress is of primary importance, investigators are interested in whether the strength of this association is different at varying levels of adversity.

Evidence for the buffering hypothesis has been decidedly mixed. An early study by Brown and Harris (1978) found that women with romantic partners they could confide in were considerably less likely to become depressed when faced with severe life events than were women without such confidants. More recent studies have also found that

social support can buffer the depressogenic effects of job stress (Lin, Probst, & Hsu, 2010) and the functional limitations associated with aging (Chan, Anstey, Windsor, & Luszcz, 2011). However decades of research seem to have generated as many unsupportive studies (e.g., Carpenter, Fowler, Maxwell, & Andersen, 2010; Lu, 1995; Parry & Shapiro, 1986) as supportive studies (e.g., Kessler, Kendler, Heath, Neale, & Eaves, 1992; Paykel, Emms, Fletcher, & Rassaby, 1980; Song & Singer, 2006). Moreover, the differences in study methodologies do not suggest obvious patterns that might indicate when support might operate as a moderator and when it might not. Cohen and Hoberman (1983) observed that perceived support buffered participants from negative life events whereas received support did but Cummins (1988) found that received support buffered adversity and perceived support did not.

The buffering hypothesis has yet to be applied to multilevel studies of social support and it is not known whether life adversity moderates the association between social support and negative mood at the trait level, social level, both, or neither. With respect to support availability, which is negatively associated with negative mood at both the trait and social levels (Lakey & Scoboria, 2005; Lakey et al., 2010), the buffering hypothesis would predict that both of these associations would be stronger among recipients facing higher levels of life adversity. Given that received support and negative mood are negatively associated at the social level (Lakey et al., 2010) this association would also be expected to be stronger among recipients undergoing significant life stress. The buffering hypothesis would not predict that the strength of the association between received support and negative mood would vary as a function of life adversity at the trait level because the trait components of received support and negative mood are positively correlated (Lakey et al., 2010).

The matching hypothesis. The matching hypothesis, first presented by Cutrona and Russell (1990), states that certain forms of social support are likely to be more or less beneficial to the recipient depending on the stressors the recipient is facing. Cutrona and

Russell (1990) suggested that stressors involving resource deficits would demand help with such resources or the performance of needed services—instrumental support. Stressors that challenge the individual's sense of worth or competence demand affirmation of those qualities—esteem support. Loss of significant others requires emotional support. Controllable stressors require informational and instrumental support, whereas uncontrollable stressors require emotional support.

The matching hypothesis is widely cited in reviews of the social support literature (Cohen, 2004; Groh, Jason, & Keys, 2008; Thoits, 1995) but relatively few investigators have evaluated Cutrona and Russell's (1990) predictions. Evidence from studies that have sought to match support and stressors has been somewhat mixed (e.g., Cutrona & Suhr, 1992; Kaniasty & Norris, 1992; Thrasher, Campbell, & Oates, 2004), but a number of findings suggest the continued utility of the matching hypothesis. For instance, in a study of nursing home employees, de Jonge and Dormann (2006) found that emotional support was more beneficial to the extent that employees were tasked with caring for terminally ill charges. Conversely, instrumental support was more beneficial to the extent that employees had difficulty completing the tasks included in their jobs. These findings are consistent with the proposal that emotional support is appropriate for individuals experiencing stressors that they cannot control and instrumental support for those with stressors that can be controlled. Chen and Tang (1997) also found that instrumental support was perceived as most useful when stressors were perceived as controllable. Similarly, an observational study of cancer patients and their partners showed that the patients (who were experiencing a largely uncontrollable stressor) benefitted more from their partners' emotional support than from attempts at instrumental help (Manne, Ostroff, Sherman, Heyman, Ross, & Fox, 2004).

Another observational study found that support recipients rated their spouses as more sensitive when requests for advice were met with informational support and expressions of emotion met with emotional support (Cutrona, Shaffer, Wesner, &

Gardner, 2007). In a laboratory study (Horowitz et al., 2001), participants assigned to a speaker role were asked to describe one of two types of recent experiences—a problem in which they felt they needed to take some sort of action but didn't know what to do, or a situation that elicited strong negative emotions. Participants assigned to a listener role were instructed to engage with the speaker such that they either tried to understand or empathize with the speaker, or tried to help solve the speaker's problem. Speakers reported greater support satisfaction and greater decreases in negative mood when the type support they received matched the type of experience they presented.

Testing the matching hypothesis with generalizability theory would add another dimension to the understanding of the association between received support and mood at the trait and social levels. First, in the only multilevel study to date on received support, Lakey et al. (2010) did not present associations for the different types of support. It is possible that different types of support (informational, emotional, instrumental) show different associations with negative mood. Second for any negative associations, the matching hypothesis would predict that the strength of those associations would be moderated by stressor controllability. The matching hypothesis would predict that the associations between instrumental and informational support at both the trait and social levels would be stronger when stressors are believed to be controllable. Conversely, associations between emotional support and mood would be expected to be stronger when individuals believe that the stressors they are facing cannot be controlled.

The platinum rule. The platinum rule states, “do unto others as they would have you do unto them” (Brock & Lawrence, 2010b). Whereas the matching hypothesis emphasizes the fit for a given style of support with the recipient's circumstances, the platinum rule emphasizes fit with the recipient's preferences. Both theories suggest that support will benefit recipients more when it better matches their needs, but needs are conceptualized differently by the two paradigms.

A number of studies have identified individual and group level differences in preferences for support. Relative to men, women tend to prefer more support in general (Manne, Alfieri, Taylor, & Dougherty, 1991). Consistent with the buffering hypothesis, individuals experiencing greater levels of adversity also desire more social support (Rose, 1990). Additionally, individuals who report a greater need for affiliation also express preferences for more emotional support (Manne et al., 1991).

In support of the platinum rule, Lawrence et al. (2008) found that the degree to which partner support corresponded to husbands' preferences for support (support adequacy) was a substantially stronger predictor of relationship satisfaction than the *amount* of support they perceived. Support adequacy is another form of perceived support because it constitutes a subjective judgment about the quality of support from one's providers. For wives, both amount of support and support adequacy were significant predictors. The degree to which amounts of perceived support match desires for support is associated with fewer symptoms of depression as well (Brock & Lawrence, 2008). Importantly, perceiving *more* support than is wanted appears to be at least as detrimental to relationship satisfaction as perceiving *less* support than one would like (Brock & Lawrence, 2009b).

The platinum rule could be evaluated using generalizability theory and the Lawrence et al. (2008) method for evaluating support adequacy. Univariate generalizability could be used to quantify the trait and social components of support adequacy. Adequacy could also be broken into separate constructs for over-support and under-support with the trait and social components computed for those constructs as well. The multivariate generalizability theory methods used by Lakey et al. (2010) could then be used to evaluate associations for support adequacy, over-support, and under-support and mood at the trait and social levels.

Overview and Specific Aims

The application of multilevel analysis to the study of social support and mood has led to several advancements in understanding the association between these two constructs. It offers the opportunity to explore many more hypotheses, several of which are the focus of the current project. The aims of this study may be divided into three categories that correspond to the focal points of the literature review. The first six aims relate to understanding substantive associations between the *trait* and *social* components of support and relevant social/psychological constructs. Aims seven through nine were measurement related. The final three aims constitute applications of multilevel analysis to three alternate models of social support.

Aims 1-5: Substantive correlates of the trait and social components of support.

Specific aim #1. To examine the associations between self-reported Big Five personality traits and the trait components of received and perceived social support. Based on previous research with global measures of support, I expected to find that extraversion, agreeableness, and conscientiousness would be positively associated with both received support and support availability. I hypothesized that neuroticism would be negatively associated with received support and support availability.

Specific aim #2. To examine the effects of recipient gender on received and perceived support. Based on previous studies with global support measures, I predicted that women would report higher levels of received support and greater perceptions of support availability. Whether this effect would remain significant after controlling for provider gender was treated as an open question.

Specific aim #3. To examine the influence of life stressors on the trait components of social support. I predicted that individuals who are experiencing a high number of substantial life stressors will *receive* more support from their social network and will *perceive* less support as available to them.

Specific aim #4. To examine the effects of provider gender on the social component of received and perceived support. Similar to aim #2, previous studies suggest that recipients report receiving more support from women than from men. I also expected that recipients would perceive that more support is available from their female providers than from their male providers. Again, whether these effects would remain significant after controlling for recipient gender was treated as an open question.

Specific aim #5. To examine the different levels of support received from different types of relationships. Previous research suggests that romantic partners provide more support, on average, than other providers. I predicted that recipients who listed a romantic partner as a support figure would report greater received support and increased support availability from those partners relative to their other support providers. There is also weak evidence to suggest that coworkers may supply less support than the average provider. I did not make specific predictions about friends, parents, siblings, or other family members.

Aims 6-8: Validity of Constructs in Multilevel Studies on Social Support.

Specific aim #6. To evaluate the extent to which global perceived support and the trait component of relationship-specific perceived support constitute equivalent constructs. If the results of studies using relationship specific measures of perceived support are to be generalized to the vast body of literature on support using global measures, the constructs must be demonstrably similar. I expected to find that global support and trait-level relationship-specific support would be highly correlated.

Specific aim #7. To assess the discriminant validity of perceived support relative to relationship satisfaction. I chose to compute the associations between support availability and relationship satisfaction at both the trait and social levels. I expected to find that these two constructs were related, but not so strongly related as to suggest that they were indistinct.

Specific aim #8. To determine the equivalence of relationship-specific positive and negative mood at the trait level and global positive and negative mood. As measured in previous generalizability studies, the trait component of positive mood represents the individual's tendency to experience positive emotions *when with* social network members. The same is true for relationship-specific negative mood. I predicted that the trait component of relationship-specific positive mood would be highly correlated with global psychological wellbeing and the trait component of relationship-specific negative mood would be highly correlated with global psychological distress.

Aims 9-11: Applications of G theory to alternative models of support and mood.

Specific aim #9. The buffering hypothesis. In accordance with the buffering hypothesis, I predicted that life stressors would moderate the trait- and social-level associations between social support and negative mood such that the associations observed between support and mood are stronger for those experiencing more adversity. I expected that the same pattern would be found for support availability.

Specific aim #10. The matching hypothesis. I predicted that the degree to which certain forms of social support would be related to negative mood at the trait and social levels would depend on the degree to which recipients perceive that the stressors they are currently facing are controllable. More specifically, I expected that among individuals who are experiencing life stressors they perceive as relatively controllable, instrumental and informational support would be associated with less negative mood. However, among individuals experiencing stressors they perceive as predominately uncontrollable, emotional support will be associated with less negative mood.

Specific aim #11. The platinum rule. I predicted that recipients who tend to receive support that is consistent with their preferences will tend to experience more positive mood and less negative mood. I also predicted that recipients would experience higher positive mood and lower negative mood when they are with providers who give

support that is particularly well matched to the recipient's preferences. I further expected that both receiving too much support and receiving too little support would be associated with less positive mood and more negative mood.

CHAPTER II

Method

Participants

Two samples of participants were recruited for this study. I chose to collect multiple samples in order to evaluate the reliability of my findings and to ensure that the study's results would generalize to a wider range of people. The student sample comprised University of Iowa undergraduate students completing Elementary Psychology and Research Methods courses. They were given course credit for participating. The community sample consisted of participants in Researchmatch.org, an online research registry. Community members were compensated \$10.00 for their participation. All participants were adults 18 years of age or older with a proficiency in the English language. Previous studies of social support using multilevel designs have had samples that ranged from roughly 100-300 participants (Lakey et al., 2010; Lakey et al., 2012; Shore & Lakey 2011). I aimed to exceed 300 participants in both samples given that some of my hypotheses demanded moderation analyses.

The ultimate size of the student sample was $N = 755$ and the ultimate size of community sample was $N = 430$. With respect to the student sample, 967 participants began the survey and 793 finished it. Of those 793, 11 participants gave what appeared to be invalid responses in that they finished the survey in an unusually short period of time (less than 30 minutes) and gave the same response to all of the items on one or more questionnaires. Of the 782 valid responses, 27 were excluded because they had 20% or more missing data on one or more measures; thus yielding a final sample of 755. Among the community participants, 720 began the survey and 461 finished it. No invalid responses were identified. After 31 participants with 20% or more missing data on one or more measures were excluded, the final sample consisted of 430 participants. Demographic information on the two samples is presented in the results section.

Procedures

The survey containing this study's measures was administered online through the Qualtrics survey system. Participants completed the survey using a computer of their choice. University of Iowa students were recruited through the Psychology Department's research participation pool. Students who signed up to participate were immediately granted access to a hyperlink for the survey. Upon completion of the survey or withdrawal from the study, students were awarded course credit for their participation.

A total of 4,382 participants in the Researchmatch.org registry were sent recruitment emails with a brief description of the study through the registry's service. Out of those recruited, 1,383 agreed to be personally contacted. I sent emails with the study's hyperlink to those 1,383 and followed up with the survey's completers to arrange monetary compensation.

Measures

All studies measures are listed in Table A1. Measures, with the exception of the extensive life adversity assessment, are provided in Appendix C.

Social support.

Received support. Relationship-specific received social support in the form of emotional support, informational support, instrumental support, and physical comfort was measured using select items from the Support in Intimate Relationships Rating Scale (SIRRS; Dehle, Larsen, & Landers, 2001). The items for each of these scales were chosen based on a factor analysis done by Barry, Bunde, Brock and Lawrence (2009a), which generated a four-factor solution with a total of 25 items. Received support was measured with respect to the preceding month. Because the SIRRS was developed for daily reports, the Dehle et al. (2001) response options were replaced with those from the Inventory of Socially Supportive Behaviors (ISSB; Barrera, Sandler, & Ramsay, 1981).

These response choices are “not at all,” “once or twice,” “about once a week,” “several times a week,” and “about every day” (Barrera et al., 1981 p. 439).

Barry et al. (2009) demonstrated that their four-factor structure of the SIRRS fit well for men and women in two samples of dating couples and one sample of married couples. The four factor structure also was invariant across five time points over five years in the samples of married couples. They found good internal consistency reliability shown through by $\alpha > .80$ for all four subscales. In the present study, we used the formulas provided by Lakey et al. (2010) (notes 1 and 2) to compute the internal consistency reliability for received support at the trait and social levels using the variance components estimates described in the analyses section. For received support, α s exceeded .80 for the total scale and all four subscales at the trait and social levels in both samples.

Support availability. The first form of perceived support included in this study was relationship-specific support availability, measured with the Support subscale of the Quality of Relationships Inventory (QRI; Pierce, Sarason, & Sarason, 1991). This subscale consists of seven items which participants rate on a four-point scale ranging from “not at all” to “very much.” The QRI Support scale has been used in several G studies and has demonstrated acceptable internal consistency reliability for both trait ($\alpha = .93-.97$) and social ($\alpha = .88-.90$) influences (Lakey et al. 2010; Shorey & Lakey, 2011). Evidence for the test-retest reliability of the Support scale is also strong (Pierce, 1994; Pierce et al., 1997). In the current study, the QRI Support scaled showed good internal consistency reliability at both the trait ($\alpha_{student} = .93$; $\alpha_{community} = .90$) and social ($\alpha_{student} = .83$; $\alpha_{community} = .85$) levels.

Global support availability. The second form of perceived support included in this study was global support availability, measured with the Social Provisions Scale (SPS; Cutrona & Russell, 1987), a commonly used perceived support instrument. The SPS contains 24 items rated on a four point scale from “strongly disagree” to “strongly

agree.” A number of studies have reported good internal consistency reliability for the SPS ($\alpha = .84$ to $.92$; Elliot, Henrick, & Witty, 1992; Gonzalez et al., 2004; Khan, Achter, & Shambaugh, 2001). The convergent validity of the SPS has been demonstrated through high correlations with the Interpersonal Support Evaluation List (ISEL; Dixon et al., 2001) and the Sense of Support Scale (SSS; Dolbier & Steinhardt, 2000). In the current study, the SPS showed good internal consistency reliability in both the student ($\alpha = .92$) and community ($\alpha = .93$) samples.

Support adequacy. Three final forms of relationship-specific perceived support were included in this study—support adequacy, over-support, and under-support. Relationship-specific support adequacy was measured using a strategy similar to that employed by Brock and Lawrence (2009b). After participants completed the SIRRS for a given support figure, the SIRRS items were presented again, along with the participants’ response choice for each item, and participants were asked whether they would have liked ‘a lot less,’ ‘somewhat less,’ ‘about the same,’ ‘somewhat more,’ or ‘a lot more’ of each form of support. From these responses, I created variables for support adequacy, over-support, and under-support. Support adequacy reflected the degree to which the quantity of support received matched the recipient’s preferences. For this variable, scores of ‘about the same’ were coded ‘2,’ scores of ‘somewhat less’ and ‘somewhat more’ were coded ‘1,’ and scores of ‘a lot less’ and ‘a lot more’ were coded ‘0.’ Over-support reflected the degree to which recipients had gotten more support than they would have preferred. To compute over-support, scores of ‘a lot less’ were coded ‘2,’ scores of ‘somewhat less’ were coded ‘1,’ and scores of ‘about the same,’ ‘somewhat more,’ and ‘a lot more’ were coded ‘0.’ Under-support reflected the degree to which recipients had gotten less support than they would have preferred. To compute under-support, scores of ‘a lot less,’ ‘somewhat less,’ and ‘about the same’ were coded ‘0,’ scores of ‘somewhat more’ were coded ‘1,’ and scores of ‘a lot more’ were coded ‘2.’ Brock and Lawrence (2009b) give evidence for the predictive validity of the over-support and under-support

constructs, showing that both predict relationship satisfaction. All three constructs showed good internal consistency reliability ($\alpha > .80$) at the trait and social levels in both samples.

Relationship satisfaction. Participants' broad positive and negative feelings about the relationships they have with each of the support figures they identify were measured with an adapted version of the Positive and Negative Quality in Marriage Scale (PNQMS; Fincham & Linfield, 1997). For use in this study, the wording "your spouse" in the PMQ items was changed to the provided names of the support providers identified by the participant using display logic in the Qualtrics system. This scale is composed of two, three-item subscales, positive relationship quality and negative relationship quality. Both the positive ($\alpha = .87-.90$) and negative ($\alpha = .89-.91$) scales have demonstrated good internal consistency reliability as well as convergent validity with other measures of relationship satisfaction and discriminant validity with affectivity (Fincham & Linfield, 1997). In the current study, both scales showed good internal consistency reliability ($\alpha > .80$) in both samples, at both the trait and social levels.

Mood.

Relationship-specific mood. Participants completed the Positive and Negative Affects Scales (PANAS; Watson, Clark, & Tellegen, 1988) three times, each time reporting on the affective states they typically experience when interacting with one of the support figures they identified. The Positive and Negative Affect scale contains 10 items each, to which participants responded on a five-point scale ranging from "not at all" or "extremely." Both scales have been used in multilevel studies and have shown acceptable internal consistency reliability for trait and social influences in those investigations (Lahey et al., 2010; Lahey et al., 2012; Shorey & Lahey, 2011). As a measures of general affectivity, the Positive ($r = .68$) and Negative ($r = .71$) Affect scales have shown good 8-week test-retest reliability (Watson et al., 1988). Watson et al. (1988) provide convincing evidence for the convergent validity of the PANAS scales through

strong associations with conceptually similar constructs (Diener & Emmons, 1984; McAdams & Constantian, 1983; Stone, Hedges, Neale, & Satin, 1985). Watson et al. (1988) also have demonstrated the discriminant validity of the PANAS scales by showing that the Positive Affect scale correlates very minimally with the Negative Affect scale and that both constructs show minimal correlations with conceptually distinct measures of mood. In the current study, both scales showed good internal consistency reliability ($\alpha > .80$) in both samples at both the trait and social levels.

Global mood. Global mood was measured with the Dysphoria and Well-Being scales of the Inventory of Depression and Anxiety Symptoms (IDAS; Watson et al., 2007). These scales measure mood over the preceding two weeks and ask respondents to rate their mood experiences on a five-point scale ranging from “not at all” to “extremely.” The Dysphoria ($\alpha = .86 - .90$) and Well-Being ($\alpha = .82 - .90$) scales have demonstrated good internal consistency reliability in a range of samples. Dysphoria ($r = .83$) and Well-Being ($r = .78$) have shown good one-week test-retest reliability as well. Convergent validity for the two scales is evidenced by positive correlations with interviewer ratings of the same mood experiences (Watson et al., 2008). In the current study, both the Dysphoria ($\alpha_{\text{student}} = .90$; $\alpha_{\text{community}} = .93$) and Well-Being ($\alpha_{\text{student}} = .90$; $\alpha_{\text{community}} = .94$) scales showed good internal consistency reliability.

Personality. The Big Five Inventory (BFI; John & Srivastava, 1999) was used to measure the Big Five personality traits. The BFI consists of 44 items, each of which describes a personality characteristic. Participants indicate the degree to which they feel the characteristics apply to them on a five point scale ranging from “disagree strongly” to “agree strongly” (John & Srivastava, 1999, p. 132). The BFI has demonstrated good internal consistency reliability for all five scales (extraversion $\alpha = .88$; agreeableness $\alpha = .79$; conscientiousness $\alpha = .82$; neuroticism $\alpha = .84$; openness $\alpha = .81$). John and Srivastava (1999) also have provided evidence of the convergent validity of the BFI. Its scales are highly correlated with corresponding scales on the NEO Five Factor Inventory

(NEO-FFI; Costa & McCrae, 1992) and the Trait Descriptive Adjectives (TDA; Goldberg, 1992) (John & Srivastava, 1999). Finally, the scales in the BFI have demonstrated good 8-week, test-retest reliability (mean $r = .83$; Rammstedt & John, 2007). In the current study, the BFI scales showed adequate internal consistency in the student sample ($\alpha > .75$) and good internal consistency in the community sample ($\alpha > .80$).

Life events. Much like the measurement of social support, the measurement of life stress has a long and controversial history. The gold standard for life stress measurement is the intensive contextual interview in which the adversity of participants' life circumstances is probed and rated by trained interviewers (Hammen, 2005; Monroe, 2008). Unfortunately, such interviews are burdensome for investigators and participants (Dohrenwend, 2006) and the person-to-person nature of the assessment may discourage some participants from disclosing stigmatized experiences (Tourangeau & Yan, 2007) such as a sexual assault or having an abortion.

Questionnaires that measure subjective appraisals of stress (e.g., feeling overwhelmed) are confounded with psychological symptoms (B. S. Dohrenwend, B. P. Dohrenwend, Dodson, & Shrout, 1984). Self-report life events checklists are an efficient and cost effective method for measuring life stress (Duggal et al., 2000) and generate assessments that are sufficiently independent of psychopathology as long as psychological symptoms (e.g., changes in sleeping or eating; Holmes & Rahe, 1967) are not included as events (B. S. Dohrenwend et al., 1984). However, checklists are known to yield increased error rates relative to interview measures (Gorman, 1993). Participants tend to over-report events on checklists to the extent that many of the events reported do not reach the degree of severity of interest to researchers.

Given the limitations of common life stress assessments, a two-step approach for life stress measurement was devised for the present study. Participants first completed an extensive checklist containing events adapted from a number of previously used

measures (Life Events and Difficulties Schedule, Brown & 1978; Life Experiences Survey, I. G. Sarason, Johnson, & Siegel, 1978; List of Recent Experiences, Henderson, Byrne, & Duncan-Jones, 1981; List of Threatening Experiences, Brugha & Cragg, 1990; Social Readjustment and Rating Scale, Holmes and Rahe, 1967). Second, participants who reported a given life event were presented with a series of follow-up questions designed to evaluate the long-term threat posed by that event. The follow-up questions were based on the probes and case exemplars employed in the Life Events and Difficulties Schedule (LEDS, Brown & Harris, 1978) and were calibrated to separate events posing a moderate or severe long-term threat from those posing some or no long-term threat. For instance, a participant who endorsed a job loss event would be asked whether losing their job was a significant financial setback, whether it was a significant career setback, and whether they were personally close with their former co-workers. If none of these conditions are met, the long-term threat was not considered sufficiently severe to merit inclusion in the estimation of the participant's overall life stress. The decision to include moderate threat events and exclude less threatening events was based on findings by Brilma and Ormel (2001) that events rated *marked* or *moderate* on the LEDS 4-point scale predicted subsequent episodes of depression whereas events rated *some* or *little/none* did not.

Because interviews were not conducted to validate the approach described above, I also generated life stress scores based on a previously validated though less rigorous approach. Brugha and Cragg (1990) have identified 11 categories of events that show good to excellent convergent validity ($r = .78-1.0$) between self-report and interviewer-rated measures. A total of 28 events in the present checklist fell into one of these 11 categories. The alternate life stress score (0-28) was assigned to each participant based purely on the number of such events endorsed, regardless of the participant's responses to follow-up questions.

Perceived control over life stressors. The degree to which participants believed they were able to influence the stressors they had experienced or were experiencing was measured with the 8-item Present Control scale of the Perceived Control over Stressful Events Scale (Frazier, Keenan, Anders, Perera, Shallcross, & Hintz, 2011). Whenever participants endorsed a life event that (a) fell into one of Brugha and Cragg's (1990) severe event categories and/or (b) was identified as moderate-severe based on follow-up questions, they were presented with the Present Control scale to which they responded with regard to that specific event. This scale has demonstrated adequate internal consistency reliability ($\alpha = .79$; Frazier et al., 2011). The Present Control scale has also shown convergent validity in that it is correlated with theoretically similar constructs such as mastery and general self-efficacy. Furthermore, it has demonstrated incremental validity in that it predicts both general and event-specific distress above and beyond these established measures (Frazier et al., 2011). To generate a single Present Control score for each participant, I averaged the scores on the Present Control items across all of the moderate/severe life events the participant reported. Computed in this way, the internal consistency reliability for Present Control was good in both the student ($\alpha = .84$) and community ($\alpha = .86$) samples.

Data Analyses

I began by replicating Lakey et al. (2010) using the data analyses they employed. The first step in this process was to calculate the trait, social, and error variance components for received support, support availability, and affect. To the constructs studied by Lakey et al. (2010), I added positive and negative relationship quality as potentially relevant correlates of social support. The variance components for each variable were computed using the mGENOVA computer program (Brennan, 2001b). The structure of these data correspond to a providers nested within recipients crossed with items design. The research participants constitute the recipients in this design. The design

may be labeled $(p : r) \times i$ in the notation of G theory (Brennan, 2001a) and Figure B1 shows a Venn Diagram of its constituent variance components.

The structure of the data collected on support, mood, and relationship satisfaction corresponds to this design because each participant reported on a different set of three separate providers and all participants completed the same set of items for each provider. As per Lakey et al. (2010) the odd and even items were summed to reduce measurement error and simplify the design. Thus the items facet for support and mood consisted of two levels. I did not sum the odd and even items for the positive and negative relationship quality variables because these variables were composed of only three items. Consequently, the items facet for positive and negative relationship quality consisted of three levels. In the language of multilevel modelling, recipients were a between-subjects factor and providers and items were within-subjects factors. Recipients, providers, and items were treated as random effects because they are assumed to be drawn from a population of possible individuals and universes of possible support providers and indicators of support.

Analyses of this design produced estimates for five effects: recipients (r , trait influences), providers nested within recipients ($p:r$, social influences), items (i), recipients crossed with items ($r \times i$), and providers nested within recipients crossed with items ($(p : r) \times i$, the highest order interaction which was used as an estimate of error). The proportion of variance attributable to each effect was computed by dividing the effect's variance component by the summed total of all five variance components.

Following Lakey et al. (2005, 2010, 2012) the standard errors for the variance proportions were estimated through normal approximation bootstrapping using the formula provided by Mooney and Duval (1993)³. This procedure was conducted by using the computer program SAS (version 9.3) to resample (with replacement) the study data a total of 50 times. Efron and Tibshirani (1986) have shown that 50 resamples is sufficient to generate an adequate estimate for the standard error. Each of these resamples was

analyzed with mGENOVA to produce a sampling distribution of variance proportions, and the standard deviation for each sampling distribution was used as the standard error of the corresponding variance proportion. Those standard errors were then used to compute 95% confidence intervals for each variance proportion. The correlations between support, mood, and relationship quality at the trait and social levels were then computed using mGENOVA with the 95% confidence intervals computed in the same manner as those for the variance proportions.

Aims #1-5. My first five aims concerned the characteristics of support receivers and support providers that might comprise the trait and social influences on received social support and support availability. G theory can be used to assess bivariate associates between variables at the trait and social level, but I wanted to evaluate the unique contributions of each of my putative correlates while controlling for contributions of the others. I therefore combined all of the characteristics I was interested in into a single model using linear mixed-effects modeling. A mixed effects model was necessary because participants each reported on three providers, meaning the observations for the outcome of interest, social support from each provider, were not independent. Linear mixed-effects modeling was completed using the lme4 package in R (version 3.02). Linear mixed effects-models can examine the influence of multiple independent variables on a single dependent variable. They can incorporate multiple fixed effects and multiple random effects. Fixed effects influence the mean of the dependent variable. The levels of a fixed effect are meaningful and may be observed in more than one member of the population. Random effects influence the variance of the dependent variable. The levels of a random effect are not of interest per se, but are assumed to be sampled from a larger population and interchangeable with any other member of that population (Crawley, 2012).

The fixed effects in my model comprised both trait- and social-level variables. In the language of multilevel modeling, the trait level equates to ‘level 2’ for this design

because ‘trait’ refers to traits of recipients who constitute a higher order facet within which providers are nested. The trait-level fixed effects were participant age, sex, personality, and life adversity. The social level is ‘level 1’ in the language of multilevel modeling because variables measured at this level constitute characteristics of providers, a lower order facet of the design. The social-level fixed effects were provider sex and participant-provider relationship. As was the case for the G theory analyses, participants and providers were random effects with providers nested within participants. Scale scores rather than items were analyzed in these models in order to simplify the design and ensure convergence of the models.

Mixed-effects models rely on certain assumptions that must be met if their parameter estimates and the corresponding standard errors are to be reliable. First, the residual scores for the dependent variable should be normally distributed. This assumption was checked through a visual inspection of a histogram of the model’s residual scores. Second, the variance in residual scores must be homoscedastic. This assumption was checked through a visual inspection of a scatterplot with the model’s predicted scores on the x-axis and the model’s residual scores on the y-axis (Nobre & Singer, 2007). Third, multicollinearity among the independent variables should be minimal. Multicollinearity was checked through the computation of variance inflation factors for each independent variable. A variance inflation factor of 10 or greater for any predictor is indicative of problematic multicollinearity (O’Brien, 2007). Finally, the parameter estimates of mixed models are vulnerable to the inordinate influence of groups (i.e. groups of providers) with extreme scores on one or more of the variables in the model. To assess the impact of highly influential groups, I computed Cook’s distance for each group and plotted those scores against altered parameter estimates generated by excluding that group from the model (Nieuwenhuis, Grotenhuis, & Pelzer, 2012). Outlying groups were removed and the model re-run to evaluate the substantive impact of excluding those data.

In addition to the unstandardized effect parameters generated by R, I used the t scores and degrees of freedom for each parameter to generate effects sizes that would facilitate interpretation of the magnitude for each effect (Oishi, Lun, & Sherman, 2007). I chose to calculate Pearson's r effect sizes so that the results in these analyses could be more easily compared with the analyses in the study which generated correlations and standardized regression coefficients. According to Cohen (1988), Pearson's r .10 - .29 are small, .30-.49 are moderate, and .50 or greater are large. I also estimated the total variance explained by the fixed effects in each model by squaring the correlation between the observed scores of the dependent variable and those predicted by the model (Long, 2012).

Aims #6-8. My next three aims focused on the equivalence of several constructs. I chose to use multilevel structural equation modeling to address these aims for two reasons. First, structural equation modeling reduces the attenuating effects of measurement error on the associations between constructs. Second, multilevel structural equation modeling permits the examination of associations between variables measured at different levels (in my case, the trait level and social level).

Mplus (version 6.11) was used for the multilevel structural equation analyses. I first estimated the measurement models for each construct through confirmatory factor analysis. The baseline measurement model for each construct consisted of a single latent factor defined by uncorrelated indicators. For measures composed of multiple multi-item scales (i.e., the Support in Intimate Relationships Rating Scale and the Social Provisions Scale) those scales were used as indicators of the latent construct. For the other measures, individual items were used as indicators. Because some of the indicators demonstrated skewed distributions, I used the Mplus MLR estimator—maximum likelihood estimation with robust standard errors (Yuan & Bentler, 2007).

Root-mean-square error of approximation (RMSEA) and the comparative fit index (CFI) were examined as indicators of model fit. These indices were evaluated

according to the criteria provided by Browne and Cudeck (1992) and Bentler and Bonett (1980). RMSEA was judged to indicate a good fit when below .05, an adequate fit when between .05 and .08, a marginal fit when between .08 and .10 and a poor fit when above .10. CFI was interpreted to indicate a good fit when above .95, an adequate fit when above .90, and a poor fit when below .90. When the measurement models did not adequately fit the observed data, I examined the questionnaires and the modification indices to determine whether dropping individual indicators might improve the model fit. Anderson and Gerbing (1988) argue that eliminating indicators is the best strategy for model re-specification because it preserves the congeneric structure of the measurement model.

Aim #9. Aim 9 was to test the buffering hypothesis for received support and support availability at the trait and social level. The buffering hypothesis suggests that there will be a stronger relationship between social support and negative mood for individuals experiencing increased life adversity. Trait-level associations are between-subjects effects. In the case of the buffering hypothesis, the trait-level associations of interest were those between the recipient's average tendency to receive/perceive social support and the recipient's average tendency to experience negative mood with support providers. To test the buffering hypothesis at the trait level, I created between-subjects variables for support and mood by taking the mean of each recipient's three scores on those variables. These variables were then analyzed using ordinary least squares regression in R. Variables with non-normal distributions were transformed by taking the natural log of each score. All predictor variables were grand-mean centered to reduce multicollinearity among interaction terms and their constituent main effects (Frazier, Tix, and Barron, 2004). Simple slopes for significant moderation effects were calculated with the 'pequod' package in R which uses the formulas provided by Cohen, Cohen, West, & Aiken (2003). Regression models were checked for non-normality of residuals,

heteroscedasticity, multicollinearity, and influential observations following the procedures outlined for aims 1-5.

With regard to the buffering hypothesis at the social level, the proposed association between support, mood, and adversity constitutes a cross-level interaction because adversity, a trait-level construct, is hypothesized to moderate the association between support and mood at the social level. As with aims 1-5, mixed linear models constructed in R (version 3.02) were used to test the buffering hypothesis at the social level. Throughout these analyses, I followed the recommendations of Aguinis, Gottfredson, and Culpepper (2013) for testing cross-level interaction effects. First, I estimated a null model in which negative mood was predicted only by the random effect for recipients. From the null model, I estimated the proportion of variance in negative mood attributable to trait influences by calculating the intraclass-correlation.

Second, I transformed received support and support availability using group mean-centering in order to isolate the social-level effects of support on mood. The “groups” in the case of this study were the three providers associated with each recipient. Transforming the social support variable in this way meant that the average support score for each recipient was zero (eliminating any trait-level variance in social support) and the score associated with each provider represented that provider’s deviation from the recipient’s average level of support. The life adversity variable was grand-mean centered as with the analyses for the buffering hypothesis at the trait level.

Third, in order for a trait-level variable to moderate the association between two social-level variables, there must be substantial variability between recipients with respect to strength of the associations between support and mood. This variability is assessed using a model in which negative affected is predicted by one of the support variables and the moderator of interest, including both a random intercept modeling the variability in mood among recipients and a random slope modeling variability in the strength of the association between support and mood between providers. Nonparametric

bootstrapping was then used to create a 95% confidence interval around the variance in slopes between recipients. Confidence intervals that do not include zero indicate sufficient variability in slopes to test for moderators (Aguinis et al., 2013).

Fourth, a full model was constructed including received support, support availability, and life adversity as predictors. For support variables that showed sufficient variability with respect to their associations with negative mood, interactions between that variable and the life adversity were also included.

Aim #10. Aim 10 was to test the matching hypothesis for received support at the trait and social levels. That matching hypothesis states that informational and instrumental support will be most helpful for recipients experiencing controllable stressors whereas emotional support and physical comfort will be most helpful for recipients experiencing non-controllable stressors. Like the buffering hypothesis, the matching hypothesis involves predictions about moderation effects. To test the matching hypothesis, I followed the procedures describes for aim #10—using ordinary least squares regression to test the matching hypothesis at the trait level and linear mixed effects modeling to test the matching hypothesis at the social level.

Aim #11. Aim 11 was to test the platinum rule—that support will be most helpful when it matches the desires of the recipient—at the trait and social levels. I first estimated the proportion of variance attributable to trait and social influences for support adequacy, over-support, and under-support. To compute this estimation, I used mGENOVA following the procedures described for my replication of the Lakey et al. (2010) findings. Those same procedures were used to calculate trait- and social-level correlations for the three support adequacy constructs with mood and relationship satisfaction.

CHAPTER III

Results

Descriptive Statistics

The student sample was 68% female ($N = 511$) and the community sample was 66% female ($N = 284$). The average age of the participants in the student sample was 19.26 ($SD = 1.66$) and was 38.20 ($SD = 13.72$) in the community sample. Appendix A contains detailed information on the race/ethnicity (Table A2), household income (Table A3), education (Table A4), relationship status (Table A5), and employment status (Table A6). Both samples were approximately 80% white; Asian participants were the next largest group in the student sample (10%) and African American participants were the next largest group in the community sample (10%). Both samples were economically diverse with respect to household income, though the meaning of “household income” for the college students may be heterogeneous with some participants choosing to include their parents’ income and others choosing to report only their own income. The community sample was generally well educated—68% had at least a bachelor’s degree. With respect to relationship status, the students were almost exclusively either single (56%) or dating (43%), whereas 45% of the community participants were married with 30% single and another 20% dating. The most common employment status identified by the students was working part time (47%) whereas the majority of community participants reported working full time (66%).

Before deciding to use the novel measure of moderate/severe life events I developed as a part of this study, I examined the validity of that measure by estimating its correlation with depression. Previous research suggests that a valid measure of life adversity should be positively correlated with depression (Kessler, 1997) and my measure showed such positive correlations in both the student and community samples (Table 7A). Also shown in Table A7 are correlations for a simple count of the number of

stressors identified by the participant and for the number of stressors experienced by the participant fitting the Brugha and Cragg (1990) criteria for a severe stressor. These constructs are labeled “All Life Events” and “A Priori Severe Events” respectively. In the student sample, the count of contextually determined moderate/severe events derived from my measure was more strongly correlated with depression than was the count of a priori severe events (though the difference between the two correlations was not statistically significant). Also, in the student sample the contextually determined construct showed a correlation with depression that was equal to that of the count of all events. In the community sample, the contextually determined count showed the strongest correlation out of the three adversity constructs. Given this evidence for the validity of the contextually determined count of moderate/severe life events, I used this construct to represent life adversity in the proceeding analyses.

The means, standard deviations, internal consistencies, and intercorrelations for the variables measured exclusively at the trait level are presented in Table A8. These statistics are consistently similar across the two samples with one notable exception. The students reported about 1 less severe life event on average than the community participants, and the associations between life adversity and the other variables in the student sample are about half the size as the corresponding associations in the community sample. A closer inspection of the adversity variable in the student sample showed that its variability (already less than in the community sample) was inflated by a single outlier, a respondent who reported 37 severe events ($Z = 14.27$). The exclusion of this outlier reduced the variable’s standard deviation to 2.10 in the student sample, as compared with 2.88 in the community sample. The restricted range of life adversity observed among the students explains the attenuated correlations between that variable and the others. Because the removal of the outlying case did little to change the correlation matrix, the case was retained for all analyses.

Trait and Social Variance Components

The proportions of variance in each of the major constructs accounted for by trait and social influences are presented in Table A9. All of the proportions were significantly different from zero, indicating that both trait and social factors influence all of the constructs under examination. In the student sample, trait and social influences accounted for roughly equal proportions of the variance in received support, support availability, and relationship satisfaction. With respect to mood, trait influences accounted for substantially more variance than social influences. The greater proportion of variance attributable to trait influences indicates that the students reported similar levels of positive and negative mood across the support providers they identified. In the community sample, social influences generally accounted for substantially more variance in the constructs of interest than trait influences. The greater proportion of variance attributable to social influences in the community sample indicates that the community participants reported more variability in terms of support, relationship satisfaction, and mood across the providers they identified.

Replication of Lakey et al. (2010)

Table A10 presents analyses replicating those presented by Lakey et al. (2010). The findings were consistently similar across the student and community samples. Like Lakey et al. (2010), I found that received support and support availability were positively correlated at both the trait and social levels and that the associations were substantially stronger at the social level. Received support showed moderate to strong associations with positive mood at the trait and social levels. In both samples, I also found that support availability was positively correlated with positive mood and negatively correlated with negative mood at both the trait and social levels. However, my results differ from those of Lakey et al. (2010) with respect to the finding central to their thesis. Whereas we both observed that received support was positively associated with negative mood at the trait

level; Lakey et al. (2010) found that received support was negatively associated with negative mood at the social level and I found that, the association between received support and negative mood was very small and nonsignificant.

To the constructs examined by Lakey et al. (2010), I added relationship satisfaction as a potentially relevant correlate of social support. Similar to relationship-specific mood, positive relationship quality was positively associated with received support and support availability at both the trait and social levels; negative relationship quality was negatively associated with support availability at the trait and social levels. Unlike relationship-specific negative mood, negative relationship quality was not significantly related to received support at the trait level and negative relationship quality was negatively associated with received support at the social level.

Aims #1-5: Correlates of the Trait and Social Components of Social Support

Received support. I next examined the effects of putative correlates (recipient age, recipient sex, recipient personality, recipient life adversity, provider sex, and relationship type) on received support and support availability. The frequency with which recipients identified male versus female providers and the frequency with which recipients identified providers from the different types of relationships are presented in Table A11. In the student sample, male recipients tended to report more male providers whereas female recipients reported more female providers. In the community sample, female recipients reported more female providers but male recipients reported a roughly equal number of male and female providers. In both samples, friends were the most common providers followed by parents and then romantic partners.

The first step in constructing the proper model was to assess for non-independence resulting from the nested structure of the data. This non-independence is equivalent to the proportion of variance in support accounted for by trait effects. A null model in which received support was predicted only by the random intercept for recipients showed substantial intra-class correlations for the student ($ICC = .48$) and

community ($ICC = .31$) samples. These estimates are consistent with those generated by the G-theory analyses (Table A9) and are sufficiently strong to support the use of mixed effects modeling.

Next, continuous variables were scrutinized for non-normality by computing skewness statistics. Skewness statistics greater than an absolute value of 1.0 indicate problematic nonnormality for linear models (Kleinbaum, Kupper, Nizam, & Muller, 2007). Life adversity was found to be right-skewed in both samples and age was found to be right-skewed in the student sample—these variables were log transformed for subsequent analyses. Categorical variables were effect coded, so the coefficients represent the difference between the mean of the support scores for the cases that take a given level of the categorical variable relative to the grand mean. The reference group was ‘Female’ for the variables corresponding to the sex of the recipient and the sex of the provider. The reference group was ‘Other’ for the variable representing the type of relationship between recipient and provider. All predictors were entered into the model simultaneously.

As shown in Table A12, the findings for received support from the two samples were largely consistent, though the predictors explained more variance in received support among the community participants ($r^2 = .32$) than the students ($r^2 = .20$). The following statistically significant predictors were observed in the model: In both samples, older participants tended to receive less support ($r_{\text{student}} = -.13$ $r_{\text{community}} = -.17$) and men tended to receive less support than women ($r_{\text{student}} = -.10$ $r_{\text{community}} = -.17$) and Extraversion ($r_{\text{student}} = .18$ $r_{\text{community}} = .23$) and openness ($r_{\text{student}} = .08$ $r_{\text{community}} = .11$) were both significantly associated with receiving more support. Romantic partners tended to provide the most support ($r_{\text{student}} = .42$ $r_{\text{community}} = .54$) while friends ($r_{\text{student}} = -.07$ $r_{\text{community}} = -.20$) and siblings ($r_{\text{student}} = -.14$ $r_{\text{community}} = -.19$) provided significantly less support on average. Controlling for relationship type and sex of the recipient, men also provided less support than women ($r_{\text{student}} = -.21$ $r_{\text{community}} = -.10$).

Some findings idiosyncratic to one of the two samples also emerged. Among the students, conscientiousness was associated with increased support ($r_{\text{student}} = .08$) and parents provided more support than average ($r_{\text{student}} = .08$). In the community sample, coworkers provided less support than average ($r_{\text{community}} = -.11$).

When the models for the two samples were checked to determine whether the assumptions of a linear mixed model had been met, I observed that the models' residuals were distributed roughly normally, that there was no substantial heteroscedasticity, and no variance inflation factors that suggested multicollinearity. When Cook's distance was computed for every recipient, there were three outlying recipients in the student sample and five outlying recipients in the community sample identified as possibly overly influential. Removing these recipients from the model did not substantially alter the models parameters, however, so those data were retained.

Received support outcomes for aims #1-5: With respect to my hypotheses, my prediction that extraversion would be positively associated with received support was supported, my prediction that conscientiousness would be positively associated with received support was supported only in the student sample, and my prediction that agreeableness would be positively associated with received support was not supported. My hypothesis that women would receive more support than men was supported but my hypothesis that recipients experiencing a higher number of stressors would receive more support was only supported in the community sample. Regarding the possible social-level predictors, recipients received more support from female providers than male providers, as I predicted. My hypothesis that romantic partners would provide more support than average was also supported whereas my hypothesis that co-workers would provide less support was only supported in the community sample.

Support availability. The null models for support availability showed substantial intra-class correlations in the student ($ICC = .33$) and community ($ICC = .25$) samples; indicating substantial trait-level variability in support availability and sufficient non-

independence among providers to warrant the use of mixed effects modeling. Table A13 shows the findings for support availability. The variance in support availability accounted for in the student ($r^2 = .19$) and community ($r^2 = .16$) groups was similar, as was the pattern of statistically significant correlates. Extraversion ($r_{\text{student}} = .22$ $r_{\text{community}} = .18$) and conscientiousness ($r_{\text{student}} = .08$ $r_{\text{community}} = .19$) were positively associated with perceived support availability. Romantic partners were perceived to be the most available for support ($r_{\text{student}} = .24$ $r_{\text{community}} = .26$) whereas coworkers were believed to be the least available ($r_{\text{student}} = -.06$ $r_{\text{community}} = -.22$). Controlling for relationship type and sex of the recipient, male providers were perceived to be less available for support than were female providers ($r_{\text{student}} = -.18$ $r_{\text{community}} = -.14$).

In the student sample specifically, older recipients tended to perceive that less support was available to them ($r_{\text{student}} = -.18$) and agreeable recipients tended to perceive more available support ($r_{\text{student}} = .20$). The students also perceived a higher than average level of support availability from their parents ($r_{\text{student}} = .10$). Among the community participants, men tended to perceive that less support was available to them than did women ($r_{\text{community}} = -.12$) and friends were perceived to be a higher than average source of potentially available support ($r_{\text{community}} = .06$).

The assumptions of normally distributed residuals, homoscedasticity, and minimal multicollinearity were met for the models in both samples. The computation of Cook's distance did not identify any outlying recipients in the community sample but did identify three outlying recipients in the student sample. The model with these three recipients excluded did not show substantially different parameter estimates from the model with the full sample, so those data were retained.

Support availability outcomes for aims #1-5: With respect to my hypotheses regarding support availability, my predictions that extraversion and conscientiousness would be positively associated with support availability were supported in both samples whereas my prediction that agreeableness would be positively associated with support

availability was supported only in the student sample. My hypothesis that neuroticism would be negatively associated with support availability was not supported. I predicted that women would perceive that more support was available to them, but this hypothesis was only supported in the community sample. Life adversity was not significantly negatively associated with support availability as I had anticipated. Consistent with my prediction, female provider were perceived to be more available for support than male providers. Also consistent with my predictions, romantic partners were perceived to more available for support than the average provider and coworkers were perceived to be less available.

Aims #6-8: Validity of the Constructs in Multilevel Studies on Social Support

Aim #6: Convergent validity for the trait component of relationship-specific support availability. Aim #6 was to evaluate the convergent validity of the trait component of relationship-specific support availability by computing its correlation with global support availability. In examining the associations between the latent constructs of interest, I first estimated the measurement model for each construct. Relationship-specific support availability consisted of a single latent factor defined by the seven items of the Support subscale of the Quality of Relationships Inventory. This model was estimated using multilevel structural equation modeling both at the within recipients level (the social level) and the between recipients level (the trait level). The model fit the data adequately in both the student (RMSEA = .06, CFI = .96) and community (RMSEA = .07, CFI = .95) samples. Global support availability consisted of a single latent factor defined by the six subscales of the Social Provisions Scale. This model was estimated only at the between recipients level. The model fit the data well in the student sample (RMSEA = .05, CFI = .97) and adequately in the community sample (RMSEA = .07, CFI = .94).

The structural model included both constructs and a correlation between the two of them at the between recipients level. In the student sample, the structural model fit the

data well (RMSEA = .05, CFI = .95) and showed a strong correlation between the two support availability constructs ($r = .58$, 95% CI [.49, .68]). In the community sample, the structural model fit the data well (RMSEA = .05, CFI = .95) and showed a *very* strong correlation between the two support availability constructs ($r = .84$, 95% CI [.73, .96]).

Outcome for aim #6. My hypothesis that the trait component of relationship-specific support availability would be strongly related to global support was supported. The observed correlations of $r = .58$ in the student sample and $r = .84$ are strong enough to support the convergent validity of trait-level relationship-specific support availability.

Aim #7: Discriminant validity of relationship-specific support availability relative to relationship satisfaction. I next sought to examine the degree to which support availability constitutes a distinct construct from relationship satisfaction. For constructs defined through factor analysis, Fornell and Larcker (1981) suggest that a construct lacks discriminant validity when the average variance extracted by the latent factor is less than the squared correlation between that factor and another latent variable. The average variance extracted is computed by taking the mean of the squared factor loadings for the indicators of a latent variable².

Before including relationship satisfaction in the structural model for the necessary analyses, I assessed the relationship satisfaction measurement model. The measurement model for relationship satisfaction consisted of two correlated latent factors, one for positive relationship quality and one for negative relationship quality. The factor for positive relationship quality was defined by the three positively worded items on the Positive and Negative Quality in Marriage Scale (adapted for all types of relationships) and the negative relationship quality factor was defined by the three negatively worded items. Both factors were modeled at the within recipients level and the between recipients level. This model fit the data well in both the student (RMSEA = .04, CFI = .98) and community (RMSEA = .04, CFI = .99) samples.

The parameters of the structural model used to assess the discriminant validity of relationship-specific support availability are presented in Table A14. Associations between relationship-specific support availability and relationship satisfaction were modeled at both the trait and social levels. Global support availability was also included at the trait level so that I could compare the associations between constructs ostensibly representing the same thing (global support availability and trait-level relationship-specific support availability) and constructs that are ostensibly different (support and relationship satisfaction). This model fit the data well in both the student (RMSEA = .04, CFI = .96) and community (RMSEA = .04, CFI = .96) groups. The models for the student and community samples generated broadly similar findings. In both samples and at both levels, positive relationship quality explained more variance in relationship-specific support availability than did negative relationship quality. At the social level, the variance in relationship-specific support availability by positive relationship quality ($r^2_{\text{student}} = .32$, $r^2_{\text{community}} = .41$) was similar to the average variance extracted from the indicators of support availability ($AVE_{\text{student}} = .47$, $AVE_{\text{community}} = .47$). In both samples, the average variance extracted was modestly higher. At the trait level, the average variance extracted from the indicators of relationship-specific support availability ($AVE_{\text{student}} = .86$, $AVE_{\text{community}} = .72$) was substantially greater than the variance in support availability explained by positive relationship quality ($r^2_{\text{student}} = .41$, $r^2_{\text{community}} = .51$). Follow-up analyses in which relationship-specific support availability was regressed on both positive and negative relationship quality showed that negative relationship quality did not explain any of the variance in support availability beyond that explained by positive relationship quality.

Outcome for aim #7. Support availability was strongly related to positive relationship quality at both the trait and social levels. I had hypothesized that these two constructs would be related but also distinct. At the trait level, the association between the support availability and positive relationship quality was substantially lower than the

average variance extracted by both factors—suggesting sufficient discriminant validity between the two constructs. At the social level, the average variance extracted by the support availability factor was only slightly higher than that factors correlation with positive relationship quality. Consequently, the discriminant validity between support availability and positive relationship quality at the social level may be considered modest at best.

Aim #8: Convergent validity for the trait component in relationship-specific mood. Aim #8 was to evaluate the convergent validity of the trait components of relationship-specific positive mood and negative mood by computing correlations between those constructs and global mood. The measurement models for relationship-specific and global mood were constructed as follows. The model for relationship-specific positive mood consisted of one latent variable defined by ten indicators—the ten positive affect items from the PANAS. This model showed an adequate fit to the data (RMSEA = .06, CFI = .94). The initial model for relationship-specific negative mood also consisted of one latent variable, this one defined by the ten negative affect items from the PANAS. The negative mood model showed an equivocal fit in both the student (RMSEA = .07, CFI = .84) and community samples (RMSEA = .08, CFI = .80). Following the guidance from Anderson and Gerbing (1988), I examined the measurement model for negative mood to determine whether excluding some indicators might substantially improve the model's fit. Inspection of the model's modification indices and the PANAS questionnaire revealed that participants responded in a highly similar to manner to several pairs of items, rendering these items functionally redundant. To improve the model fit, I first dropped one item ('afraid') from the most highly redundant pair ('scared' and 'afraid'). When this adjustment failed to sufficiently address the misfit, I dropped a second item ('guilty') from a second pair ('guilty' and 'ashamed') and then a third ('jittery') from the pair ('nervous' and 'jittery'). Each time one of the items was dropped the choice of item was based on the degree of improvement observed in both

models. The final measurement model for relationship-specific negative mood consisted of seven items and fit the data adequately in both the student (RMSEA = .06, CFI = .91) and community (RMSEA = .06, CFI = .94) samples.

The measurement model for global positive mood consisted of a single latent factor defined by the eight Well-Being items from the IDAS. This model showed an adequate fit in both the student (RMSEA = .06, CFI = .92) and community (RMSEA = .07, CFI = .94) samples. The measurement model for global negative mood consisted of a single latent factor defined by the ten Dysphoria items from the IDAS. This model fit the data in the community sample (RMSEA = .06, CFI = .92) but showed an equivocal fit in the student sample (RMSEA = .07, CFI = .88). As was the case with relationship-specific negative mood, I identified a pair of items that appeared to be functionally redundant ('I had trouble concentrating' and 'I had trouble making up my mind'). I dropped the item 'I had trouble concentrating' and the model without this indicator fit the data adequately in both the student (RMSEA = .06, CFI = .90) and community (RMSEA = .05, CFI = .95) samples.

The structural model for assessing the convergent validity of global and relationship specific mood contained the four measurement models described in this section thus far along with latent factors for positive and negative relationship quality. Relationship satisfaction was included so that I could compare the associations between the constructs that were hypothesized to be equivalent (the mood constructs) with associations between mood and relationship quality, constructs which should be distinct. Table A15 presents the standardized correlations between the variables of interest at both the trait and social levels. The model that generated these correlations fit the data adequately in both the student (RMSEA = .03, CFI = .90) and community (RMSEA = .03, CFI = .93) samples.

As table A15 shows, the trait components of relationship-specific mood were significantly and substantially associated with global mood. Relationship specific positive

mood was correlated with global positive mood ($r_{\text{student}} = .42$, $r_{\text{community}} = .57$) and relationship specific negative mood was correlated with global negative mood ($r_{\text{student}} = .48$, $r_{\text{community}} = .47$). In the community sample, the correlations between the convergent mood constructs were substantially greater than those between the mood constructs and relationship satisfaction. In the student sample, however, relationship specific positive mood was correlated with positive relationship quality $r = .40$ and relationship specific negative mood was correlated with negative relationship quality $r = .43$.

Outcome for aim #8. I predicted that trait-level, relationship-specific positive mood would be strongly correlated with global positive mood and that trait-level, relationship-specific negative mood would be strongly correlated with global negative mood. This hypothesis was supported for both positive and negative mood. However, in the student sample, relationship satisfaction showed equally strong associations with relationship-specific mood. In comparing the associations between trait-level, relationship-specific mood and global mood with the associations between trait-level relationship-specific mood and relationship satisfaction, it is apparent these associations are too similar to suggest that the trait component for relationship specific mood reflects one's overall mood more so than it reflects one's tendency to report positive or negative relationships.

Aims #9-11: Multilevel Analysis of Alternate Models of Social Support

Aim #9: The buffering hypothesis. Applied to multilevel analysis of social support and mood, the buffering hypothesis suggests that the association between support and mood will be particularly strong for recipients who have recently experienced more adverse life events. I tested the buffering hypothesis with respect to both received support and support availability at both the trait and social levels.

The buffering hypothesis at the trait level. The buffering hypothesis was evaluated at the trait level using ordinary least squares regression with social support averaged across each recipient's providers. The natural log of the life adversity variable

was used as in the analyses for aims 1-5; negative mood also was substantially right-skewed and was log-transformed as well. Received support and support availability showed roughly normal distributions (skewness < |1|). Support and life adversity were grand-mean centered. In the model used to test the buffering hypothesis, negative mood was predicted by received support, support availability, life adversity, an interaction term for received support and life adversity, and an interaction term for support availability and life adversity.

The parameters for buffering hypothesis model at the trait level are presented in Table A16. Negative mood was negatively associated with support availability ($\beta_{\text{student}} = -.39$, $\beta_{\text{community}} = -.33$) and positively associated with received support ($\beta_{\text{student}} = .33$, $\beta_{\text{community}} = .26$) and life adversity ($\beta_{\text{student}} = .07$, $\beta_{\text{community}} = .19$). The interaction terms between support and life adversity were not significant with the exception of the interaction between support availability and life adversity in the community sample ($\beta = -.11$). Consistent with the buffering hypothesis, recipients who were experiencing elevated life adversity and perceived low support availability reported a particularly high level of negative mood. As depicted in Figure B3, support availability was negatively associated with negative mood among recipients experiencing low adversity ($\beta_{\text{community}} = -.21$) but was more strongly negatively associated with negative mood among recipients experiencing high adversity ($\beta_{\text{community}} = -.44$). This model did not exhibit any problems with non-normal residuals, heteroscedasticity, or multicollinearity. The computation of Cook's distance identified one outlying influential case in each sample, but the parameters for the models run without those cases were not altered substantially; the cases were therefore retained.

The buffering hypothesis at the social level. The first step in evaluating the buffering hypothesis at the social level was to check the proportion of variance in relationship-specific negative mood accounted for by trait effects. The null model in which negative mood was predicted only by the random intercept for recipients showed

substantial intra-class correlations for the student ($ICC = .60$) and community ($ICC = .38$) samples. These estimates are highly consistent with those generated by the G-theory analyses (Table A9) and are sufficiently strong to support the use of mixed effects modeling.

The next step in evaluating the buffering hypothesis at the social level was to assess the variability in support/mood associations among providers. This variability was computed through a models in which negative mood was predicted by support, life adversity, a random intercept for recipients, and a random slope for the effects of support on mood. To isolate the social-level covariance between support and mood, support was group-mean centered so that the support score for each provider represented that provider's deviation from the mean of the three providers for that recipient. The variance in slopes for the association between received support and negative mood was significant in the student ($\tau_{11} = .005$, 95% CI [.002, .009]) and community ($\tau_{11} = .005$, 95% CI [.002, .009]) samples. The variance in slopes for the association between support availability and negative mood also was significant in the student ($\tau_{11} = .11$, 95% CI [.05, .18]) and community ($\tau_{11} = .18$, 95% CI [.11, .26]) samples. Significant variability in slopes suggests that there may be moderating variable that could account for that variability. A final model was constructed in which negative mood was predicted by received support, support availability, life adversity, and interaction terms between adversity and the two support constructs (Table A17).

In both samples, support availability was significantly negatively associated with negative mood ($r_{\text{student}} = -.18$, $r_{\text{community}} = -.34$). Received support, which did not show a significant bivariate association with negative mood (Table A10), was significantly positively associated with negative mood ($r_{\text{student}} = .12$, $r_{\text{community}} = .24$) when controlling for the other covariates. Follow-up analyses showed that support availability was responsible for this suppression effect (Mackinnon, Krull, & Lockwood, 2000). The

effects for the interaction between adversity and received support were nonsignificant; as were the effects for the interaction between adversity and support availability.

The final model was checked for the assumptions of linear mixed-effects models. I found no problems with non-normal residuals, heteroscedasticity, or multicollinearity. The Cook's distance analyses identified a single outlying case in both samples. The models run with those cases did not generate substantially different parameters from the models with all of the data, so those cases were retained.

Outcome for aim #9. The buffering hypothesis proposes that the association between social support and negative mood will be stronger for recipients facing significant adversity. The buffering hypothesis was not supported for received support at the trait level. The buffering hypothesis was supported for support availability at the trait level but only in the community sample. No evidence was found for the buffering hypothesis at the social level.

Aim #10: The matching hypothesis. The matching hypothesis suggests that informational/instrumental support will be more strongly associated with decreased negative mood among recipients who are experiencing controllable stressors whereas emotional/physical comfort support will be more strongly associated with decreased negative mood among recipients who are experiencing uncontrollable stressors. I tested the matching hypothesis at both the trait and social levels.

The matching hypothesis at the trait level. As with the buffering hypothesis, the matching hypothesis was evaluated at the trait level using ordinary least squares regression with social support averaged across each recipient's providers. The natural log of negative mood was used variable was used as in the analyses for the buffering hypothesis. The four types of received support (informational, emotional, instrumental, and physical comfort) and perceived control over stressors showed roughly normal distributions (skewness < |1|). All predictors were grand-mean centered. Because the matching hypothesis relates to control over stressors, only recipients who had

experienced at least one moderate-severe stressor could be included in these analyses. These samples comprised 520 students and 343 community members. In the model used to test the matching hypothesis, negative mood was predicted by informational support, emotional support, instrumental support, physical comfort, perceived control, and four interaction terms for the product of perceived control and each type of support.

The parameters for matching hypothesis model at the trait level are presented in Table A18. Whereas total received support was positively associated with negative mood (Table A16), there emerged some distinctions with respect to associations shown by different types of received support. Specifically, informational support was positively associated with negative mood ($\beta_{\text{student}} = .23$, $\beta_{\text{community}} = .35$) whereas emotional support was negatively associated with negative mood ($\beta_{\text{student}} = -.33$, $\beta_{\text{community}} = -.25$). Perceived control over stressors was negatively associated with negative mood ($\beta_{\text{student}} = -.29$, $\beta_{\text{community}} = -.34$). In the student sample only, physical comfort was positively associated with negative mood ($\beta_{\text{student}} = .13$).

The main effects in the student and community samples were quite consistent, but the interaction effects showed different patterns between the two groups. In the student sample, the interaction effects were consistent with the matching hypothesis. Emotional support was not significantly related to negative mood among recipients who perceived a high degree of control over their stressors but was strongly, inversely related to negative mood among recipients who perceived a low degree of control ($\beta_{\text{student}} = -.54$, Figure B4). Instrumental support had not shown a significant main effect on negative mood and was not significantly associated with negative mood among recipients high in perceived control. However, instrumental support was positively associated with negative mood among recipients low in perceived control ($\beta_{\text{student}} = .25$, Figure B4).

Significant interaction effects were found in the community sample as well, but these ran counter to the matching hypothesis. As in the student sample, instrumental support had no main effect on negative mood, nor was it associated with negative mood

among recipients with high perceived control. It was significantly associated with negative mood among recipients with low perceived control, but, unlike in the student sample, was negatively associated with negative mood ($\beta_{\text{student}} = -.25$, Figure B5). Physical comfort also showed a significant interaction with perceived control. However, standard simple slopes analyses did not show physical comfort to be significantly associated with negative mood at high or low levels of perceived control. Follow up analyses in R's 'pequod' package using the Bauer and Curran (2005) regions of significance approach showed that physical comfort was negatively associated with negative mood for recipients scoring 5.1 standard deviation above the mean on perceived control (less than 0.1% of the sample). Physical comfort was positively associated with negative mood for recipients scoring 1.2 standard deviations below the mean on perceived support (11.5% of the sample).

The models in Table A18 were checked for the appropriate assumptions and I found no problems with non-normal residuals, heteroscedasticity, or multicollinearity. The cooks distances analyses revealed no outlying cases for the community sample but did show one outlying case for the student sample. Because the model run without that case generated parameters that were highly similar to those of the model with the full sample, that case was retained.

The matching hypothesis at the social level. Because the analysis of the buffering hypothesis had already established that there was substantial trait-level variability in negative mood, the first step in evaluating the matching hypothesis at the social level was to assess the within recipients variability in the associations for negative mood with informational support, emotional support, physical comfort, and instrumental support. It was not possible to estimate the variance in slopes for the association between negative mood and physical comfort because the trait component of physical comfort was functionally zero and the random slope for physical comfort was perfectly correlated with

the random intercept. The variance in slopes for the other three types of support was significant in both samples (Table A19).

The final model for the matching hypothesis is presented in Table A20. In both samples, perceived control over life stressors showed a significant, negative correlation with negative mood ($r_{\text{student}} = -.50$, $r_{\text{community}} = -.51$). Received physical comfort was positively associated with negative mood ($r_{\text{student}} = .15$, $r_{\text{community}} = .26$) and received emotional support was negatively associated with negative mood ($r_{\text{student}} = -.18$, $r_{\text{community}} = -.41$). The interaction terms between support and negative mood were non-significant in both samples. With respect to assumptions for linear mixed models, the models' residuals were roughly normally distributed, they showed no substantial heteroscedasticity, and multicollinearity was minimal.

Outcome for aim #10. I tested the matching hypothesis for four types of support in two samples at both the trait and social levels. The matching hypothesis predicts that informational and instrumental support will be negatively associated with negative mood among recipients with high perceived control over their stressors whereas emotional support and physical comfort will be negatively associated with negative mood among recipients with low perceived control over their stressors. I found two interaction effects that supported the matching hypothesis—those for emotional support and instrumental support at the trait level in the student sample. I also found two interaction effects that countered the matching hypothesis. In the community sample, at the trait level, instrumental support was negatively associated with negative mood among recipients low in perceived control. Also in the community sample and at the trait level, physical comfort was positively associated with negative mood among recipients reporting low perceived control, though only for a small portion of the sample. The other interaction effects, including all of those at the social level, were nonsignificant.

Aim #11: The platinum rule. The platinum rule suggests that social support will be most beneficial when it matches the preferences of the recipient. At the trait level, this

would mean that individuals who tend to receive support in the quantities they prefer would tend to experience more positive mood and less negative mood on average. At the social level, the platinum rule implies that recipients will report that they experience more positive mood and less negative mood when they are with specific providers who give support that more closely matches their preferences.

For descriptive purposes, Figure B3 shows the frequency of recipients' responses to the survey questions about desire for more or less support. These charts show that, in both samples, many recipients were generally satisfied with the quantity of support they had gotten. Out of those who were dissatisfied, most would have liked to receive more support.

To evaluate the platinum rule, I first used mGENOVA to estimate the proportions of variance attributable to trait and social influences for support adequacy, under-support and over-support (Table A21). The proportions of variance for all three constructs were similar to those for received social support. In the student sample, about half of the variability in support adequacy, under-support, and over-support was accounted for by trait influences and about half was accounted for by social influences. In the community sample, about one third of the variability in the three constructs was attributable to trait influences and about two thirds was attributable to social influences.

The next step in evaluating the platinum rule was to examine the associations for support adequacy, under-support, and over-support with mood and relationship satisfaction at the trait and social levels. Table A22 presents these associations. Over-support and under-support were not substantially correlated at the trait or social levels—indicating that these two constructs captured two separate dimensions rather than a single dimension in which a recipient might get either too much or too little support. With respect to the outcomes of interest, received support had been positively correlated with negative mood at the trait level (Table A10) but support adequacy was negatively correlated with negative mood at both the trait ($r_{\text{student}} = -.49$, $r_{\text{community}} = -.23$) and social

($r_{\text{student}} = -.19$, $r_{\text{community}} = -.48$) levels. At both levels and in both samples, receiving too little support and receiving too much support were significantly positively associated with negative mood. Conversely, received support had shown strong positive associations with positive mood across samples and levels, but support adequacy showed only a small positive correlation with positive mood at the social level in the community sample.

The pattern that emerged for mood was generally true for relationship satisfaction as well. Although the associations between support adequacy and positive relationship quality were mostly statistically significant, they were not as strong as the associations between support adequacy and negative relationship quality. The other pattern that emerged among the associations between support adequacy and relationship satisfaction (in both samples) was that receiving too much support was more strongly negatively associated with positive quality whereas receiving too little support was more strongly positively associated with negative relationship quality.

Outcome for aim #11. The platinum rule was tested in two samples, at the trait and social levels, for three constructs—over-support, under-support, and overall support adequacy. In support of the platinum rule, support adequacy was consistently negatively associated with negative mood whereas over-support and under-support were consistently positively associated with negative mood. Also consistent with the platinum rule, over-support was consistently negatively associated with positive mood.

CHAPTER IV

Discussion

Not all social relationships are equally supportive. The degree to which one person receives support from another person or perceives that support would be available if it were to be needed is influenced both by characteristics of the recipient and by characteristics of the provider. Previous studies have examined the relative importance of trait influences (characteristics of the recipient) and social influences (characteristics of the provider and the unique recipient-provider relationship) in determining the amount of support individuals receive or perceive to be available. The first set of aims in this study focused on the identification of specific characteristics of recipients and providers that would be associated with the recipients' receptions and perceptions of social support. To examine trait influences and social influences concurrently, multilevel study designs in which recipients report on multiple providers are required. The use of these designs is increasing but the constructs generated by these designs have not been well validated. My second set of aims focused on examining the validity of support availability and mood as measured in multilevel studies of social support. Finally, previous multilevel studies have examined bivariate correlations between social support and mood, but a large body of social support literature suggests that the association between support and mood may be more complex. The third set of aims in this study focused on testing several alternative models of social support and mood with a multilevel design.

Summary and Interpretation of Results

Replication of Lakey et al. (2010). Lakey et al. (2010) found that received support was positively associated with negative mood at the trait level but negatively associated with negative mood at the social level. In other words, recipients who acquired more social support, on average, from their support providers, reported experiencing more negative mood. After accounting for this trait effect, recipients tended to associate the least negative mood with their most supportive providers.

I did not replicate the discrepancy found by Lakey et al. (2010) with respect to the association between received support and negative mood at the trait versus social levels. I did observe that recipients who averaged higher levels of received support reported more negative mood. However, the bivariate association between received support and negative mood at the social level was not significant. In fact, after controlling for support availability, recipients reported that they experienced *more* negative mood when interacting with their most supportive support providers. Consistent with Lakey et al. (2010), I found that received support was also positively related to positive mood at both the trait and social levels. Recipients who received more support, on average, from their providers reported increased positive mood. Recipients also reported that they experienced the most positive mood when interacting with their most supportive providers. Furthermore, the associations between received support and positive mood were substantially stronger than those for received support and negative mood. Taken together, these findings indicate that the reception of social support is associated with increases in both positive and negative emotions.

Aims #1-5: Characteristics of supportive providers and well-supported recipients.

Received support. The variance components analysis in mGENOVA showed that both recipient characteristics and provider/relationship characteristics account for substantial proportions of the variance in received support. I identified several characteristics of recipients who received more support overall from their providers. Female recipients tended to receive more support than male recipients and younger recipients tended to receive more support than older recipients. With respect to personality, more extraverted recipients tended to receive more support as did recipients who were more open to new experiences. Notably, the association between received support and openness, though statistically significant, was quite small.

I also identified several characteristics of support providers that were associated with increased support provision. Female providers gave recipients more support than male providers and romantic partners gave more support than providers from other relationships. Friends, siblings, and non-first-degree relatives gave less support than the average provider.

Support availability. The proportion of variance in support availability attributable to recipient characteristics was statistically significant, but small. The only specific recipient characteristics that showed a consistent association with received support were extraversion and conscientiousness; recipients who were more extraverted and more conscientious perceived that more support was available to them if they were to need it.

Provider/relationship characteristics accounted for substantially more of the variance in support availability and I identified several such characteristics in my analysis. These characteristics were generally the same as those associated with increased received support. For instance, recipients perceived that more support was available from female providers than from male providers. Recipients also believed that romantic partners were a better than average source of available support. Coworkers were seen as less likely to provide support.

Aims #6-8: Validity of the constructs in multilevel studies on social support.

Support availability. I examined the convergent and discriminant validity of relationship-specific support availability through its associations with global support availability and relationship satisfaction. I observed good convergent validity for relationship-specific support availability in that the trait facet of relationship-specific support availability was highly correlated with global support availability. Recipients who averaged high levels of support availability from the three specific providers they reported on also reported high levels of perceived support availability when asked to respond based on their entire social network. The trait facet of relationship-specific

support availability was also strongly correlated with the trait facet of positive relationship quality.

Recipients who, on average, reported high levels of support availability from their providers also, on average, expressed high levels of satisfaction with those relationships. However, the trait-level association between relationship-specific support availability and positive relationship quality was not as strong as the associations among the items measuring relationship-specific support availability and not as strong as the association between relationship-specific support availability and global support availability. These associations indicate that relationship specific support availability and positive relationship quality are distinct constructs at the trait level. Conversely, the social-level association between relationship-specific support availability and positive relationship quality was about equally as strong as the social-level associations among the items measuring relationship-specific support availability. The fact that the items that measure relationship-specific support availability are not substantially more related to each other than they are to positive relationship quality indicates poor discriminant validity; i.e., that relationship-specific support availability and positive relationship quality are not genuinely distinct constructs. This lack of discriminant validity at the social level is particularly concerning given that the social component accounts for considerably more variance in support availability than the more valid trait component.

Aims #9-11: Multilevel analysis of alternative models of support and mood.

The buffering hypothesis. The buffering hypothesis suggests that social support will be more helpful for recipients experiencing increased life adversity than for recipients with fewer stressors. At the trait level, this would mean that the degree to which recipients with higher average levels of support experience lower average levels of negative mood will vary based on the recipients recent stressful experiences—support will be strongly linked to negative mood among recipients who have experienced more life adversity and less strongly linked to average negative mood among recipients who

have experienced less adversity. At the social level, the buffering hypothesis would suggest that recipients experiencing high life adversity would report particularly low negative mood when interacting with their most supportive providers. The association between providers' supportiveness and the mood experienced with those providers would not be as strong for recipients with less life adversity.

In this study, the buffering hypothesis was tested for received support and support availability, at the trait and social levels, among the student and community samples—eight tests of statistical significance. Only the finding for support availability at the trait level among the community participants was statistically significant. Taken together, these analyses do not provide substantial support for the buffering hypothesis.

The matching hypothesis. The matching hypothesis suggests that informational and instrumental support will be more strongly associated with low negative mood among recipients who perceive a high degree of control over their life stressors whereas emotional support and physical comfort will be more strongly associated with low negative mood among recipients who perceive a low degree of control over their life stressors. At the trait level, this would mean that perceived control would moderate the associations for the average levels of each of these four types of support for the average levels of negative mood across providers. At the social level, this would mean that perceived control would moderate the degree to which differences in supportiveness within recipients' provider groups would be associated with differences in negative mood experienced with individual providers.

The analyses used to examine the matching hypotheses first revealed that the different types of received support had different associations with negative mood. Overall received support was positively associated with negative mood and this positive association was observed for informational support at the trait level and physical comfort at the social level. Recipients who, on average, received more advice, guidance, and

information from their providers also reported, on average, more negative mood. Recipients also reported that they received the most physical comfort (kisses, hugs, hand holding) from the providers with whom they experienced the most negative mood. Conversely, emotional support was negatively associated with negative mood at both the trait and social levels. Recipients who acquire more emotional support, on average, also reported lower average levels of negative mood. Providers from whom recipients received the most emotional support were associated with the least negative mood.

With respect to the interaction effects that were the focus of the matching hypothesis, I examined interactions between perceived control and three types of received support (emotional, informational, and instrumental), at the trait and social levels, among the student and community samples—twelve tests of statistical significance. Of these twelve tests, two interactions were statistically significant in favor of the matching hypothesis and two interactions were statistically significant in opposition to the matching hypothesis. The results for emotional support and instrumental support supported the matching hypothesis in the student sample but the results for instrumental support and physical comfort contradicted the matching hypothesis in the community sample. Given the unclear pattern of findings and the possibility of observing statistically significant parameters merely by chance, these findings taken as a whole do not support the matching hypothesis.

The platinum rule. The platinum rule states that social support will be most helpful when it matches the preferences of the recipient. Some recipients might desire a high level of emotional support and a modest level of informational support, others a high level of informational support and little physical comfort, still others might desire a high level of all types of support. In this study, the platinum rule was supported at both the trait and social levels. With respect to the trait level, recipients who consistently received support that matched their preferences consistently reported lower negative mood in their

interpersonal relationships. For the social level, recipients reported the least negative mood with the providers who gave the support that best matched their preferences.

Most recipients reported that they received less support than they wanted. And although receiving too much support was associated with increased negative mood at both the trait and social levels, those associations were considerably weaker than the strong positive associations between negative mood and lack of support. In contrast with received support, the constructs for support adequacy were not as strongly related to positive mood.

Implications

Because this study was strictly observational and employed a cross-sectional design, any interpretations regarding possible *causes* of social support or mood must be regarded as hypotheses. With respect to support and mood specifically, it is likely that any causal relation between those two constructs is reciprocal. For instance, the primary finding resulting from my replication of Lakey et al. (2010) was that received support was strongly, positively related to positive mood but only weakly related to negative mood. To the extent the receiving social support has an impact on one's mood, it appears that support may augment positive feelings but (with the possible exception of emotional support) does not, on average, alleviate negative feelings. At the trait level, the positive association between received support and positive mood may be partly explained through the effects of positive emotionality on support receptions. Extraverted individuals tend to experience a greater frequency and intensity of positive emotions (Watson & Clark, 1997) and I observed in this study that extraverted recipients received higher average levels of support. It is therefore possible, that recipients who express higher levels of positive mood when they are with their providers are more likely to attract support from those providers.

Aims #1-5: Characteristics of supportive providers and well-supported recipients. This study found that extraversion was associated with increased receptions

of social support. Given that association, it is possible that introverted recipients who would like to receive more social support may do so by behaving in a more extraverted manner. Although the rank-order stability of extraversion is relatively high, some individuals do become substantially more extraverted (relative to their same-aged peers) than they once were (Lüdtke, Trautwein, & Husemann, 2009; Roberts, O'Donnel, & Robins, 2004). Those who do become more extraverted over time perceive higher levels of social support (Von Dras & Siegler, 1997). As to why extraversion may increase, individuals who come to place a higher value on interpersonal relationships tend to become more extraverted (Roberts et al., 2004), and randomized controlled trials of cognitive behavior therapy have shown that people with depression and anxiety disorders become more extraverted following treatment (Gi, Egger, Kaarsemaker, & Kreutzkamp, 2010; Tang, DeRubeis, Hollon, Amsterdam, Shelton, & Schalet, 2009).

It seems reasonable that most recipients would have some sense of who is more or less supportive within their social network. To the extent that recipients are unsure of whom to seek out when support is needed, the findings from this study suggest that parents may be an especially good source of support for young adults whereas co-workers are not a particularly good source of support for those working full time. It would also seem important for both male and female recipients to have some female support providers given that they tend to be more supportive than men. Overall, the largest effect observed in these analyses showed that romantic partners provide, by far, the most support for the average person. Consequently, many recipients without a romantic partner or with an unsupportive partner are likely to experience lower than average levels of social support.

Aims #6-8: Validity of the constructs in multilevel studies on social support.

The results of my attempts to validate some of the constructs found in multilevel studies of social support should shape the interpretation of the findings, both in this study and in previous multilevel investigations. The very high correlation between the trait component

of relationship-specific support availability and global support availability suggests that these constructs are functionally equivalent. Much has been learned about global support availability over the past three decades and the properties of global support availability identified through previous research should generally apply to the trait component of relationship-specific support availability. Additionally, that which has and will be learned about the trait component of relationship-specific support availability should also generally apply to global support availability.

The correlation between the trait component of relationship-specific support availability and the trait component relationship satisfaction was also high. That correlation was not as high as the correlation between relationship-specific support availability and global support availability and not high enough to suggest that relationship-specific support availability and relationship satisfaction are equivalent constructs at the trait level. It follows then, that trait-level support availability represents more than recipients' positive feelings toward their providers; that it reflects some additional features of those relationships that indicate whether or not the provider would be available for support if support was needed.

With respect to the social component of relationship-specific support availability, I observed a lack of discriminant validity between support availability and relationship satisfaction. This lack of discriminant validity suggests that support availability, at the social level, does not represent anything more than recipients' positive feelings toward their providers. Although those positive feelings are likely *influenced* by the interactions between recipient and provider, support availability should not be interpreted to represent some quality of those interactions per se.

From the moderately high correlations between the trait component of relationship-specific mood and global mood, I learned that these two constructs are related but not equivalent. This finding suggests that the results of previous multilevel studies of social support and mood need to be reinterpreted given that those studies have

exclusively relied upon relationship-specific measures and presented their findings as though trait-level relationship specific mood represented recipients' global mood states. The lack of equivalence between trait-level relationship-specific mood and global mood does not diminish the importance of the findings in this study or in previous research. Rather, it clarifies that the trait component of relationship-specific mood is an interpersonal construct that does not necessarily reflect recipients' mood states when they are not with other people. Given that constructs such as depression (e.g., Hames, Hagan, & Joiner, 2013) and life satisfaction (e.g., Heller, Watson, & Ilies, 2004) have well-documented interpersonal components, relationship specific approaches to measuring mood are useful for exploring hypotheses related to mood in general. However, it must be borne in mind when interpreting the results of relationship-specific analyses that non-interpersonal factors may also influence recipients' global mood states.

Aims #9-11: Multilevel analysis of alternative models of support and mood.

The buffering hypothesis. The analyses of the buffering hypothesis did not reveal convincing evidence that social support is more impactful when the recipient is facing substantial life stress. However, those analyses did show that received support was positively associated with negative mood at the social level after controlling for support availability. Received support had shown no significant bivariate association with negative mood at the social level. One possible explanation for this suppressor effect is that increases in received support can have two possible outcomes. The first outcome is that increases in received support lead the recipient to view the provider more positively and decrease the negative mood experienced with that provider. The second outcome is that increases in received support do not lead the recipient to view the provider more positively but rather increase the negative mood experienced with that provider. As I will elaborate when discussing the platinum rule, this second outcome may, in part, be due to the overprovision of support.

The matching hypothesis. The clearest finding derived from the analyses on the matching hypothesis was that emotional support was negatively associated with negative mood whereas informational support (at the trait level) and physical comfort (at the social level) were positively associated with negative mood. One possible implication of this pattern of results is that emotional support may be uniquely well suited to alleviating negative mood for the average person.

The positive association between instrumental support and negative mood at the trait level may be due in part to the fact that getting advice or guidance with problem solving evokes negative mood from the recipient. Although informational support *could* generate negative mood because the recipient finds that form of help unpleasant to receive, most of the participants in this study expressed a preference for *more* informational support. If informational support is truly deleterious, recipients must be unaware of its negative effects. Alternatively, it is possible that the reception of informational support evokes negative mood from the recipient because that form of support focuses the recipient's attention on the stressors for which the recipient requires guidance. Informational support may be helpful in that regard though not associated with an immediate relief from negative mood. A final and complementary possibility is that recipients who tend to express negative mood when they are with their support providers tend to elicit suggestions from those providers regarding how they might handle their stressors.

The total amount of physical comfort received by recipients was not associated with overall negative mood, but recipients did report experiencing more negative mood with the recipients from whom they received the most physical comfort. For this association, the explanation that getting a hug, a kiss, or holding a provider's hand would most often lead to increases in negative mood seems implausible. Rather, it may be useful to consider physical comfort a marker of relationship intimacy. Recipients may feel more comfortable expressing negative emotions with particularly close providers. Emotionally

intense relationships also carry a higher risk for interpersonal conflict (Laursen & Collins, 1994). It may be that recipients experience more negative mood with providers such as their parents and spouses, from who they receive the most physical comfort, because their high frequency of interaction provides ample opportunities for conflict. Specifically because of the level of openness associated with particularly close relationships, intimate providers may feel more free to express their annoyance or disapproval with the recipient and engender more negative mood on the part of the recipient in that manner (Miller, 1997). Additionally, the rejections, criticism, neglect, and ill temper recipients receive from especially close providers may generate more negative mood than the same social transactions with less intimate providers simply because the relationships with the close providers mean so much to the recipient (Miller, 1997).

The platinum rule. The platinum rule had already been supported within the context of marital relationships (Brock & Lawrence, 2009) and this study supported its application to close social relationships more broadly. In general, both too much support and too little support were associated with undesirable mood changes. These findings suggest that it is important for recipients to communicate their desired levels of support to their providers and that it is equally important for providers to learn recipients' preferences. Parsing the data more finely, oversupport was generally more strongly associated with decreased positive mood whereas undersupport was generally more strongly associated with increased negative mood. Therefore, a typical overly supportive relationship would be characterized by the recipients muted emotional expressions—the recipient might not be particularly sad, anxious, or angry with that provider but would not experience much positive emotion either. The typical under-supportive relationship would be characterized by average levels of positive emotions but increased levels negative emotions as well.

Strengths

One strength of this study was that all of the hypotheses were tested on two samples, which enabled me to immediately assess the replicability of the study's findings. A further strength of the study was that most of the statistically significant associations were observed in both samples. Some of the discrepancies, such as the particular importance of parents as support figures in the student sample, had intuitive explanations. The consistency of the findings was related to an additional strength of the study, that of the large number of participants in both samples.

This study also represents an important advancement in statistical methods used to analyze multilevel data on social support. Previous multilevel studies had only examined bivariate associations between constructs at the trait and social levels. By using mixed-effects modeling, I was able to evaluate the unique associations of several independent variables with one dependent variable while controlling for the other independent variables in the model. The ability to control for other independent variables was important in understanding the inter-related effects of recipient sex, provider sex, and relationship type on levels of social support and in uncovering a suppressor effect in the association between received support and negative mood.

Regarding another novel feature of the statistical analyses I employed, previous multilevel studies had only examined associations between relationship-specific variables. By using multilevel structural equation modeling, I was able to examine the associations between global constructs that were measured exclusively at the trait level and the trait components of the relationship-specific constructs. These analyses were instrumental in demonstrating the validity of relationship-specific support availability at the trait level and the *limited* validity of relationship-specific mood at the trait level.

Limitations

Cross-sectional, correlational design. Ultimately, social support researchers want to know whether, when, and how receiving social support *causes* changes in the

recipient's mood. Given the correlational nature of this study, its results can only be used to generate suggestions for how social support and mood *might* be causally related. Any proposals regarding causal relations must be considered all the more tentative because the constructs were all measured at the same point in time. I therefore did not have the ability to control for previous mood states or previous levels of support when estimating the associations of interest.

Interpreting the variance proportions. Several considerations should be borne in mind when interpreting the proportions of variance ascribed to trait influences and social influences in this study. Recipients, providers, and items were treated as random facets, meaning that the G theory analyses assume that a) recipients were randomly selected from a population of all possible recipients, b) the providers for each recipient were randomly selected from a population of all of that recipient's providers, and c) the forms of support that constitute the items in the questionnaires I used were randomly selected from a population of all possible forms of support that a recipient could receive. For the student sample in particular, those recipients may have been more homogenous with respect to support reception than, for instance, the population of adults in the United States. This homogeneity would downwardly bias the trait-level variance in social support.

The population of support providers relevant to the study of social support and mood is, as of yet, poorly defined. Although this study identified several characteristics of the *most* important providers, there is little information in the social support literature that would identify the *boundaries* of a recipient's population of providers. In other words, it is difficult to say how often a recipient must interact with a provider, how meaningful those interactions must be, or how much personal significance that relationship must hold for the recipient before a given individual should be considered to be a member of the population of a recipient's support providers. A further complication is the fact that the size of the provider population is likely to be different from recipient to

recipient. The recipients in this study were asked to report on, “the three adults (or peers) you talk with and/or spend time with the most.” Given this sampling strategy, it is likely that the three providers identified by the recipients would have given *more* support than the average member of the recipients’ support provider populations. Consequently, the samples of provider are likely more homogeneous than the populations as a whole and estimates of the social-level variance in support are likely downwardly biased.

Finally, the 25 items on this study’s measure of received support hardly represent every possible form of support that a recipient might receive. In particular, the SIRRS does not cover support derived through mutual participation in pleasurable activities. Additionally, the shortened version of the SIRRS used in this study did not include items from the full scale such as “...cried with me about a situation,” “...prayed/meditated with me,” or “...spent extra time with me,” that measure the support that may be derived simply from having an attentive and engaged provider physically present. This restricted range of support behaviors would downwardly bias estimates of the variability in social support related to the items in the questionnaire. Given that each variance component is likely an underestimate, to some degree, of the variability in support attributable to the facets under investigation, it is difficult to say whether or how the *proportions* of variance for the trait and social facets would be different were a more optimal measurement strategy executed.

Areas for Future Research

Longitudinal studies. As of yet, no multilevel studies have examined the longitudinal effects of social support on mood (or those of mood on social support). Designing such a study would be challenging given the field’s limited understanding of how long it takes for the possible positive effects of social support to accrue or how long those effects might last. The preponderance of research on social support has focused on support that has been received or available over an extended period of time, such as the month-long interval chosen for this study.

Some investigations have examined concurrent levels of support and depression while controlling for past levels of depression (Leskelä et al., 2006; Johnson, Meyer, Winett, & Small, 2000; Symister & Friend, 2003). Whereas studies with a purely cross-sectional design answer the question, “are your depressive symptoms over the past month related to the support you received over the past month?” studies that control for previous levels of depression answer the question, “is the change in your depressive symptoms last month to this month related to how much support you received this month?” Controlling for previous levels of depression rules out the possibility that the association between current levels of depression and support can be explained exclusively by the influence of the previous month’s depressive symptoms. However, given that support and depression are measured in month-long intervals, it is not possible to know whether an improvement in support preceded an improvement in depression, or an improvement in depression preceded an improvement in support. Studies that have looked for prospective associations between previous levels of support and current levels of depression while controlling for previous levels of depression have generally failed to find significant results (e.g., Monroe, Bromet, Connell, & Steiner, 1986). Such null findings simply suggest that social support from the recent past more heavily influences one’s mood than support from the more distant past.

The search for prospective associations between social support and mood from month to month has not been particularly fruitful, but some researchers have found prospective associations when support and mood are measured from day to day (DeLongis, Caperol, Holtzman, O’Brien, & Campbell, 2004; Feldman, Downey, & Schaffer-Neitz, 1999). These studies of perceived support offer relatively strong evidence that high support on one day leads to improvements in mood the following day. The effects of support on mood observed in these two studies were small ($\beta = .03-.07$) but these findings raise the possibility that consistently high perceptions of support may lead to substantial mood improvements over time. In addition to examining the average daily

effects of support from the past 24 hours, future studies should look for additive effects that might accrue over several days.

Experimental studies. Social support researchers are ultimately interested in how an understanding of support processes can be used to improve the mood of support recipients and improve the relationships between recipients and providers. Previous interventions have targeted social support in a number of different ways. Some interventions have focused on directly increasing support, either from a non-directive therapist (Cuijpers, Driessen, Hollon, van Oppen, Barth, & Andersson, 2012), from a minimally trained peer (Dennis, Hodnett, Reisman, Kenton, Weston, & Kiss, 2009), or from a support group (Chen, Tseng, Chou, & Wang, 2000). Other interventions have sought to improve recipients support by improving the recipient's social skills (Stravynski, Marks, & Yule, 1982), restructuring the recipient's cognitions about social interactions (Brand, Lakey, & Berman, 1995), or encouraging support providers to give more help (Friedland & McColl, 1992). Interpersonal Psychotherapy may be considered a social support intervention because it aims, in part, to help recipients ask for a specific, desired forms of support, identify and seek out underutilized providers, and reappraise unrealistic expectations of providers (Stuart & Robertson, 2012). Couple's therapy can also involve interventions targeted toward social support. In emotionally focused couples therapy, for instance, romantic partners are encouraged to support each other in-session and to ask for support they haven't requested before (Greenberg, James, & Conry, 1988). In behavioral couple therapy, partners may choose supportive behaviors to perform for each other (Jacobson & Margolin, 1979).

Although many of the interventions referenced above have been shown to reduce depressive symptoms and some have been shown to increase social support, it is not known whether any of those interventions reduce depressive symptoms *because* they increase social support. To demonstrate that a psychosocial intervention improves the mood of its participants by increasing their social support, it must be shown through

formal mediation analyses that improvements in mood can at least partly be accounted for by increases in social support. More specifically, it must be shown that improvements in social support are associated with improvements in mood *and* that improvements in social support *precede* improvements in mood. Previous studies have shown that the development of a positive working relationship between therapist and client mediates the benefits of many forms of psychotherapy (Kazdin, 2007). The benefits of cognitive therapy specifically appear to be partly mediated by clients' increased ability to observe and describe their thoughts and the benefits of acceptance and commitment therapy appear to be partly mediated by clients' willingness to experience unwanted thoughts and feelings (Forman, Herbert, Moitra, Yeoman's, & Geller, 2007). Similar mediational studies of Interpersonal Psychotherapy, couples therapies, and social skills interventions could provide a very strong test of the hypothesis that recipients' depressed mood can be improved by improving their social support.

Other influences on social support. The predictors of social support examined in this study explained between 16% and 32% of the variance in the social support variables under investigation. Consequently, although this study has been informative in this regard, there are additional trait and social influences that may explain why some social interactions are most supportive than others. These could include characteristics of the individual such as emotional intelligence (Lopes, Salovey, & Straus, 2003), physical attractiveness (Sarason, et al., 1985), the length of time the recipient has lived in his or her geographic location, and the frequency with which the recipient gives support to his or her providers (Jaekel, et al., 2012). Other influences could also include relationship characteristics such as the duration of the relationship, the geographic proximity of the provider, the cultural similarities/differences between providers, or the number of mutual social ties shared between provider and recipient (Stokes, 1983).

Extraversion and social support. This study found that extraversion was associated with receiving more social support and perceiving greater support availability.

Extraversion is a broad construct, however, comprised of many patterns of behaviors. For instance, Costa and McCrae (1992) have identified six specific facets of extraversion—warmth, gregariousness, assertiveness, activity, excitement seeking, and positive emotions. Several of these facets may be uniquely associated with the increased reception of social support for different reasons. Potential support providers may enjoy interacting with recipients who are interpersonally warm and/or express a high level of positive emotions. Potential providers may support such recipients either as compensation for support the providers had themselves received or in hopes of receiving support from those warm, positive people in the future. Several studies suggest that individuals who give social support are more likely to receive social support (Bowling et al., 2005; Brown, Nesse, Vinokur, & Smith, 2003; Jaeckel et al., 2012). Conversely, gregarious recipients may receive more support simply because spending more time with others creates more opportunities for support reception. Assertiveness may be associated with receiving more social support because recipients who are comfortable asking for help may be more likely to receive it. In this study, I was not able to make distinction among the facets of extraversion because I used a brief measure of personality. Future studies with more extensive measures could investigate the unique associations between different facets of extraversion and social support.

The validity of support availability at the social level. I found that support availability showed poor discriminant validity from relationship satisfaction in this study. The Support scale of the Quality of Relationships Index used as a measure of support availability in this and other multilevel studies on social support is only one of the many measures of support availability. For instance, Neely et al. (2006) used the Social Provisions Scale as their measure of support availability. It is possible that a different measure of support availability might capture some support related characteristic of the recipient/provider relationship beyond the recipient's generic positive feelings toward the provider.

The validity of received support. Given that measures of received support are intended to capture the recently performed behaviors of support providers, the best way to validate a multilevel approach to measuring received support would be to ask the identified providers to complete measures of enacted support for the same time period. Past studies with one recipient and one provider have shown that these two recipient reports of support received and provider reports of support enacted are fairly highly correlated (Antonucci & Israel, 1986; Cohen et al., 2005). Studies with multiple providers could validate both the trait and social components of received support. Validating the trait component would show that recipients and providers generally agree with respect to whether the recipient gets more or less overall support than the average recipient. Validating the social component would show that recipients and providers generally agree with respect to which of the recipients' specific relationships are more or less supportive. Given the moderately high correlations between received and enacted support in prior studies, it is possible that both or only one of the trait and social components of received support might demonstrate high convergent validity.

The matching and buffering hypotheses. In a sense, this study was consistent with the larger body of research on the buffering and matching hypotheses in that, like the wider body of literature on these two models, my findings were inconclusive. Studies on the matching hypothesis are still somewhat rare, and additional tests with large sample sizes may reveal that sampling error alone can account for the inconsistency in previous findings. Conversely, a large number of studies have been conducted on the buffering hypothesis and it seems unlikely that two or three more would resolve the existing discrepancies. Rather, it may be that social support buffers the negative effects of life stressors only under certain conditions. That is, the moderating effect may itself be moderated by other variables. Perhaps social support only buffers the impact of life stressors when it is delivered discretely (Bolger, Zuckerman, & Kessler, 2000) or when the recipient has regular opportunities to reciprocate that support (Jaekel et al., 2012). If

these sorts of three-way interactions are to be identified reliably, studies with large sample sizes will be required.

CHAPTER V

Conclusion

Many factors may explain why some social interactions are more supportive than others. In this study, I found that women received more support than men and that recipients who were younger, more extraverted, and more open to new experiences also received more support. Recipients got more support from their romantic partners and less from their family and friends. Regardless of relationship type, female providers tended to give more support than male providers. Recipients who want a relatively high level of support should speak openly, spend time with others frequently, and seek opportunities for cultural engagement and new experiences regularly. They should also seek out or maintain a romantic relationship and cultivate relationships with female support providers.

The validation related aims in this study showed that support availability was a valid construct at the trait level. The findings derived from studies on global support availability may be generalized to trait-level relationship-specific support availability and vice-versa. At the social level, support availability was not convincingly distinct from relationship satisfaction. Therefore, the social component of relationship satisfaction may reflect little more than the recipient's generic positive feelings toward his or her providers. Support availability at the relationship level should not be interpreted as a direct indicator of the variability in supportiveness among a recipient's providers. Trait-level relationship-specific mood was strongly related to global mood, but not so strongly as to suggest that they are equivalent constructs. Only measures of global mood can be

used to evaluate the influence of support on the mood recipients experience when not with support providers.

This study's test of the buffering and matching hypotheses did not show broad support for those models. However, the tests did uncover several interesting findings. Received support may improve recipients' negative mood only in so much as it elevates support availability. Given the near zero bivariate correlation received support showed with negative mood, support as experienced by the average recipient is just as likely to be unhelpful as it is helpful. More specifically, emotional support appears most likely to improve recipients' negative mood whereas informational support may exacerbate it. Additionally, both too much and too little support from their providers may increase recipients' negative mood and decrease recipients' positive mood.

APPENDIX A.

TABLES

Table A1. Study Constructs and Corresponding Measures

Construct	Measure
Social Support	
Relationship-specific Received Support	Support in Intimate Relationships Rating Scale (SIRRS)
Relationship-specific Support Availability	Quality of Relationships Inventory (QRI) Support subscale
Global Support Availability	Social Provisions Scale (SPS)
Support Adequacy	Support in Intimate Relationships Rating Scale (SIRRS)
Mood	
Relationship-specific Positive Mood	Positive and Negative Affect Scales (PANAS) Positive Affect scale
Relationship-specific Negative Mood	Positive and Negative Affect Scales (PANAS) Negative Affect scale
Global Positive Mood	Inventory of Depression and Anxiety Symptoms (IDAS) Well-Being scale
Global Negative Mood	Inventory of Depression and Anxiety Symptoms (IDAS) Dysphoria scale
Relationship Satisfaction	
Positive Relationship Quality	Positive and Negative Quality in Marriage Scale (PNQMS) Positive Quality scale
Negative Relationship Quality	Positive and Negative Quality in Marriage Scale (PNQMS) Negative Quality scale
Life Adversity	Novel, computer adapted life adversity assessment
Perceived Control Over Stressors	Perceived Control over Stressful Events Scale (PCSES) Present Control scale

Table A2. Participant Race/Ethnicity

	Student		Community	
	Frequency	Percent	Frequency	Percent
American Indian or Alaskan Native	1	0%	3	1%
Asian or Pacific Islander	76	10%	9	2%
Black/African American	28	4%	44	10%
Caucasian, not of Hispanic Origin	589	78%	352	82%
Hispanic of Any Origin	42	6%	12	3%
Other	19	2%	9	2%

Note. One community participant did not specify a race/ethnicity.

Table A3. Participant Household Income

	Student		Community	
	Frequency	Percent	Frequency	Percent
Less than \$15,000 per year	157	21%	34	8%
\$15,000 - \$30,000	37	5%	57	13%
\$30,000 - 45,000	58	8%	68	16%
\$45,000 - \$60,000	82	11%	50	12%
\$60,000 - \$75,000	70	10%	49	12%
\$75,000 - \$90,000	82	11%	53	12%
More than \$90,000	250	34%	114	27%

Note. Nineteen students and five community participants did not specify a household income.

Table A4. Community Participant Education

	Frequency	Percent
Did not graduate high school	1	0%
High school/GED	36	8%
Vocational degree or Associate's degree	50	12%
Currently in college	49	11%
Bachelor's degree	129	30%
Master's degree	130	30%
Advanced graduate degree (M.D., Ph.D., J.D., etc.)	34	8%

Note. One participant did not specify a level of education.

Table A5. Participant Relationship Status

	Student		Community	
	Frequency	Percent	Frequency	Percent
Single (including widowed/divorced and not currently in a romantic relationship)	426	56%	128	30%
Dating (boyfriend/girlfriend)	321	43%	84	20%
Engaged	5	1%	15	4%
Married (together)	2	0%	194	45%
Married (but separated)	0	0%	9	2%

Note. One student did not specify a relationship status.

Table A6. Participant and Partner Employment Status

	Student				Community			
	Participant		Partner		Participant		Partner	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Employed full-time (30+ hours/week)	5	1%	56	17%	283	66%	206	71%
Employed part-time	351	47%	163	50%	63	15%	30	10%
Unemployed (looking for a job)	160	21%	38	12%	25	6%	12	4%
Not employed and not looking for a job	238	31%	72	22%	57	13%	43	15%

Note. One student and two community participants did not identify their employment status. Partner data are available only for participants who indicated that they were in a romantic relationship. Two community participants did not identify their partner's employment status.

Table A7. Correlations Between Different Life Adversity Constructs and Depression

	Depression	
	Student	Community
All Life Events	.21 [.14, .28]	.37 [.28, .45]
A Priori Severe Events	.19 [.12, .25]	.26 [.17, .35]
Contextually Determined Severe Events	.21 [.14, .28]	.44 [.36, .51]

Note. The confidence intervals of correlations in **bold** do not include zero.

Table A8. Descriptive Statistics and Intercorrelations for Exclusively Trait-level Variables

	Student			Community			1	2	3	4	5	6	7	8	9
	<i>M</i>	(<i>SD</i>)	α	<i>M</i>	(<i>SD</i>)	α									
Dysphoria ¹	22.60	(8.37)	.90	20.43	(8.81)	.93		-.52	.41	-.43	-.25	-.24	-.39	.65	-.01
Well-Being ²	28.90	(6.22)	.90	26.44	(7.59)	.94	-.42		-.23	.55	.43	.27	.38	-.54	.21
Life Adversity ³	1.91	(2.46)	NA	2.85	(2.88)	NA	.20	-.11		-.11	.04	.01	-.12	.23	.15
Global Perc. Supp. ⁴	80.73	(10.59)	.92	80.65	(10.86)	.93	-.42	.41	-.07		.34	.35	.32	-.39	.18
Extraversion ⁵	27.59	(6.22)	.85	25.37	(7.17)	.87	-.23	.46	.00	.36		.17	.16	-.32	.28
Agreeableness ⁶	35.40	(5.65)	.79	35.14	(6.00)	.81	-.23	.22	-.06	.38	.20		.21	-.42	.22
Conscientiousness ⁷	32.16	(5.57)	.78	34.56	(6.30)	.83	-.37	.32	-.08	.36	.14	.31		-.38	.06
Neuroticism ⁸	23.02	(6.19)	.82	22.60	(7.24)	.87	.53	-.45	.18	-.23	-.36	-.28	-.26		-.17
Openness ⁹	34.36	(6.03)	.76	36.70	(6.79)	.81	.02	.23	.08	.06	.25	-.12	.04	-.14	

Note. Global Perc. Supp. is global perceived support as measured by the Social Provisions Scale. Internal consistency is not an appropriate indicator of reliability for counts of life stressors. Correlations below the diagonal are from the student sample; those above the diagonal are from the community sample. Correlations presented in **bold** are statistically significant at $p < .05$.

Table A9. Trait and Social Variance Components for Major Constructs

Source	Student		Community	
	$\hat{\sigma}^2$	% [95% CI]	$\hat{\sigma}^2$	% [95% CI]
Received support				
Trait influences	61.69	46 [42, 51]	33.58	30 [23, 34]
Social influences	65.44	49 [49, 58]	74.94	66 [58, 70]
Support availability				
Trait influences	1.34	20 [17, 22]	1.19	17 [12, 23]
Social influences	2.35	35 [33, 39]	3.34	49 [43, 54]
Positive Quality				
Trait influences	0.89	52 [44, 61]	0.53	30 [23, 37]
Social influences	0.67	40 [32, 47]	1.09	62 [55, 70]
Negative Quality				
Trait influences	2.78	53 [48, 58]	2.15	38 [32, 45]
Social influences	2.09	40 [35, 45]	3.06	54 [48, 61]
Positive Mood				
Trait influences	9.51	56 [51, 61]	9.23	49 [44, 55]
Social influences	5.54	33 [28, 32]	7.72	41 [36, 46]
Negative Mood				
Trait influences	4.21	57 [48, 64]	2.13	36 [25, 46]
Social influences	2.48	33 [27, 41]	3.22	55 [46, 65]

Note. $\hat{\sigma}^2$ = raw variance component. % = percentage of total variance accounted for by each facet. CI = confidence interval. None of the 95% confidence intervals included zero.

Table A10. Multivariate Generalizability Correlations between Support, Relationship Satisfaction, and Mood

Variable	Received Support	Support Availability	Positive Quality	Negative Quality	Positive Mood	Negative Mood
Received Support						
Trait influences		.38 [.22, .52]	.24 [.12, .39]	.13 [-.06, .31]	.37 [.26, .51]	.20 [.04, .39]
Social influences		.56 [.51, .61]	.39 [.34, .44]	-.11 [-.03, -.17]	.43 [.36, .49]	.05 [-.02, .14]
Support Availability						
Trait influences	.46 [.34, .55]		.72 [.59, .86]	-.31 [-.51, -.14]	.69 [.56, .82]	-.20 [-.03, -.37]
Social influences	.54 [.49, .59]		.66 [.61, .71]	-.37 [-.44, -.30]	.60 [.55, .65]	-.27 [-.35, -.18]
Positive Quality						
Trait influences	.22 [.13, .30]	.64 [.46, .79]		-.26 [-.09, -.46]	.47 [.35, .57]	-.14 [-.29, .01]
Social influence	.39 [.34, .49]	.58 [.54, .63]		-.54 [-.62, -.47]	.67 [.62, .72]	-.39 [-.47, -.31]
Negative Quality						
Trait influences	-.05 [-.17, .09]	-.40 [-.51, -.28]	-.31 [-.40, -.21]		-.23 [-.39, -.08]	.40 [.27, .53]
Social influences	-.20 [-.27, -.15]	-.32 [-.38, -.26]	-.49 [-.55, -.43]		-.47 [-.54, -.40]	.57 [.51, .64]
Positive Mood						
Trait influences	.54 [.48, .60]	.58 [.49, .66]	.43 [.31, .54]	-.24 [-.34, -.13]		-.02 [-.13, .13]
Social influences	.44 [.39, .51]	.47 [.42, .54]	.56 [.51, .62]	-.32 [-.38, -.27]		-.29 [-.38, -.21]
Negative Mood						
Trait influences	.24 [.15, .34]	-.30 [-.17, -.42]	-.30 [-.42, -.16]	.46 [.36, .53]	.12 [.03, .20]	
Social influences	.01 [-.05, .07]	-.12 [-.07, -.19]	-.17 [-.25, -.10]	.40 [.34, .46]	-.08 [-.15, .00]	

Note: Correlations for the student sample are presented below the diagonal; those for the community sample are presented above the diagonal. The confidence intervals of correlations in **bold** do not include zero.

Table A11. Frequency of Provider Sex and Provider Relationship Values

	Student		Community	
	Count	Percent	Count	Percent
Male Recipients				
Male Providers	437	60.3%	206	47.5%
Female Providers	288	39.7%	228	52.5%
Female Recipients				
Male Providers	454	29.7%	264	31.0%
Female Providers	1074	70.3%	588	69.0%
Friends	929	41.1%	429	33.3%
Coworkers	21	0.9%	130	10.1%
Siblings	225	9.9%	132	10.2%
Parents	728	32.1%	236	18.3%
Other Family	83	3.7%	111	8.6%
Partners	239	10.6%	223	17.3%
Other	40	1.8%	27	2.1%

Table A12. Trait and Social Predictors of Received Support

Correlate	Unstandardized Coefficient	SE	df	t	r
Student					
(Intercept)	68.02	0.93	1781	72.84*	
Age	-22.86	8.06	750	-2.84*	-.10
Sex	-2.74	0.73	777	-3.74*	-.13
Provider Sex	-3.27	0.37	1733	-8.86*	-.21
Neuroticism	0.18	0.12	745	1.51	.06
Extraversion	0.55	0.11	744	5.03*	.18
Agreeableness	0.09	0.12	744	0.72	.03
Conscientiousness	0.25	0.12	747	2.15*	.08
Open	0.23	0.11	743	2.19*	.08
Friend	-2.66	0.89	1891	-3.00*	-.07
Coworker	-4.50	3.28	1926	-1.37	-.03
Sibling	-7.24	1.20	1834	-6.05*	-.14
Parent	2.93	0.90	1811	3.27*	.08
Other Family	-4.36	1.74	1872	-2.51*	-.06
Partner	22.58	1.16	1801	19.46*	.42
Life Adversity	-0.75	0.93	745	-0.80	-.03
r ² = .20					
Community					
(Intercept)	58.23	0.83	672	70.27*	
Age	-0.19	0.05	438	-3.66*	-.17
Sex	-2.70	0.75	425	-3.59*	-.17
Provider Sex	-1.53	0.47	1046	-3.24*	-.10
Neuroticism	0.20	0.11	415	1.78	.09
Extraversion	0.48	0.10	416	4.75*	.23
Agreeableness	0.01	0.12	416	0.07	.00
Conscientiousness	0.15	0.11	415	1.30	.06
Open	0.25	0.10	416	2.34*	.11
Friend	-6.38	0.91	1174	-6.97*	-.20
Coworker	-4.86	1.35	1144	-3.61*	-.11
Sibling	-8.43	1.30	1092	-6.46*	-.19
Parent	-1.10	1.08	1077	-1.02	-.03
Other Family	-4.03	1.47	1178	-2.74*	-.08
Partner	2.20	1.08	1030	20.46*	.54
Life Adversity	0.63	0.99	417	0.63	.03
r ² = .32					

**p* < .05

Table A13. Trait and Social Predictors of Support Availability

Correlate	Unstandardized Coefficient	SE	df	t	r
Student					
(Intercept)	23.38	0.17	1954	133.36*	
Age	-6.33	1.29	750	-4.88*	-.18
Sex	-0.22	0.12	797	-1.82	-.06
Provider Sex	-0.64	0.08	1923	-8.02*	-.18
Neuroticism	-0.01	0.02	742	-0.63	-.02
Extraversion	0.11	0.02	741	6.09*	.22
Agreeableness	0.10	0.02	740	5.48*	.20
Conscientiousness	0.44	0.02	764	2.32*	.08
Openness	0.00	0.02	740	-0.24	-.01
Friend	-0.06	0.19	2129	-0.33	-.01
Coworker	-1.91	0.69	2166	-2.77*	-.06
Sibling	0.43	0.26	2062	1.69	.04
Parent	0.84	0.19	2029	4.39*	.10
Other Family	0.49	0.37	2108	1.32	.03
Partner	2.82	0.25	2018	11.33*	.24
Life Adversity	-0.08	0.15	743	-0.56	.02
$r^2 = .19$					
Community					
(Intercept)	21.84	0.19	712	115.31*	
Age	-0.02	0.01	444	-1.80	-.08
Sex	-0.43	0.16	427	-2.61*	-.12
Provider Sex	-0.57	0.12	1132	-4.65*	-.14
Neuroticism	0.02	0.02	413	0.84	.04
Extraversion	0.08	0.02	414	3.82*	.18
Agreeableness	0.04	0.03	415	1.52	.07
Conscientiousness	0.10	0.02	413	3.96*	.19
Openness	0.04	0.02	415	1.97	.10
Friend	0.50	0.23	1248	2.15*	.06
Coworker	-2.76	0.35	1229	-7.96*	-.22
Sibling	-0.02	0.33	1183	-0.05	.00
Parent	0.19	0.28	1166	0.67	.02
Other Family	-0.05	0.38	1249	-0.13	.00
Partner	2.55	0.28	1106	9.02*	.26
Life Adversity	-0.30	0.21	416	-1.42	.07
$r^2 = .16$					

* $p < .05$

Table A14. Discriminant Validity of Support Availability Relative to Relationship Satisfaction

Construct	Average Variance Extracted	r^2		
		1	2	3
Student				
Social Level				
Positive Quality ¹	.62			
Negative Quality ²	.74	.22		
QRI Support Availability ³	.47	.32	.10	
Trait Level				
Positive Quality ¹	.96			
Negative Quality ²	.94	.10		
QRI Support Availability ³	.86	.41	.14	
Global Support Availability ⁴	.63	.19	.10	.35
Community				
Social Level				
Positive Quality ¹	.74			
Negative Quality ²	.80	.27		
QRI Support Availability ³	.47	.41	.15	
Trait Level				
Positive Quality ¹	.94			
Negative Quality ²	.92	.07		
QRI Support Availability ³	.72	.51	.07	
Global Support Availability ⁴	.58	.30	.12	.70

Table A15. Correlations Representing the Convergent Validity of Relationship-specific Mood and Global Mood

Construct	1	2	3	4	5
Student					
Social Level					
Relationship-specific Positive Mood ¹					
Relationship-specific Negative Mood ²	-.22				
Positive Relationship Quality ³	.58	-.24			
Negative Relationship Quality ⁴	-.33	.50	-.48		
Trait Level					
Relationship-specific Positive Mood ¹					
Relationship-specific Negative Mood ²	.10				
Positive Relationship Quality ³	.40	-.29			
Negative Relationship Quality ⁴	-.24	.43	-.31		
Global Positive Mood ⁵	.42	-.08	.24	-.13	
Global Negative Mood ⁶	-.01	.48	-.20	.28	-.48
Community					
Social Level					
Relationship-specific Positive Mood ¹					
Relationship-specific Negative Mood ²	-.37				
Positive Relationship Quality ³	.70	-.43			
Negative Relationship Quality ⁴	-.51	.64	-.55		
Trait Level					
Relationship-specific Positive Mood ¹					
Relationship-specific Negative Mood ²	.07				
Positive Relationship Quality ³	.38	-.03			
Negative Relationship Quality ⁴	-.13	.28	-1.0		
Global Positive Mood ⁵	.57	-.17	.35	-.18	
Global Negative Mood ⁶	-.12	.47	-.06	.26	-.58

Table A16. Regression Model Testing the Buffering Hypothesis at the Trait Level

Correlate	Unstandardized Coefficient	SE	t	β
Student				
(Intercept)	3.71	0.01	414.39*	
Received Support	1.6e ⁻³	1.8e ⁻⁴	8.56*	.33
Support Availability	-0.01	1.1e ⁻³	-10.18*	-.39
Life Adversity	0.03	0.01	2.16*	.07
Rec. Supp. × Adversity	-4.9e ⁻⁴	2.8e ⁻⁴	-1.76	-.07
Supp. Avail. × Adversity	-2.4e ⁻⁴	1.6e ⁻³	-0.15	-.01
r ² = .16				
Community				
(Intercept)	3.67	0.01	346.73*	
Received Support	1.3e ⁻³	2.5e ⁻⁴	5.18*	.26
Support Availability	-0.01	1.23e ⁻³	-6.57*	-.33
Life Adversity	0.06	0.01	4.21*	.19
Rec. Supp. × Adversity	-7.8e ⁻⁵	3.4e ⁻⁴	-0.23	-.01
Supp. Avail. × Adversity	-3.8e ⁻³	1.8e ⁻³	-2.18*	-.11
r ² = .16				

*p < .05

Table A17. Mixed Effects Model Testing the Buffering Hypothesis at the Social Level

Correlate	Unstandardized Coefficient	SE	df	t	r
Student					
(Intercept)	14.20	0.17	755	83.64*	
Received Support	0.02	0.01	426	2.40*	.12
Support Availability	-0.13	0.04	393	-3.63*	-.18
Life Adversity	0.33	0.25	755	1.31	.10
Rec. Supp. × Adversity	-1.9e ⁻³	0.01	373	-0.19	-.01
Supp. Avail. × Adversity	-0.01	0.05	369	-0.22	-.01
r ² = .01					
Community					
(Intercept)	13.47	0.17	430	77.21*	
Received Support	0.05	0.01	619	6.25*	.24
Support Availability	-0.27	0.04	328	-6.57*	-.34
Life Adversity	1.13	0.24	430	4.64*	.22
Rec. Supp. × Adversity	2.9e ⁻³	0.01	601	0.27	.01
Supp. Avail. × Adversity	-0.11	0.06	310	-1.90	-.11
r ² = .07					

Table A18. Regression Model Testing the Matching Hypothesis at the Trait Level

Correlate	Unstandardized Coefficient	SE	t	β
Student				
(Intercept)	3.71	0.01	355.80*	
Informational Support	3.5e ⁻³	1.3e ⁻³	2.72*	.23
Emotional Support	-4.3e ⁻³	1.1e ⁻³	-3.77*	-.33
Instrumental Support	1.3e ⁻³	1.6e ⁻³	0.83	.07
Physical Comfort	3.5e ⁻³	1.4e ⁻³	2.52*	.13
Perceived Control	-0.02	2.5e ⁻³	7.40*	-.29
Info. Supp. × Control	2.8e ⁻⁴	3.1e ⁻⁴	0.37	-.08
Emo. Supp. × Control	6.7e ⁻⁴	2.8e ⁻⁴	2.36*	.21
Instrum. Supp. × Control	-8.8e ⁻⁴	4.2e ⁻⁴	-2.11*	-.18
Phys. Comf. × Control	-5.7e ⁻⁴	3.4e ⁻⁴	-1.69	-.08
r ² = .16				
Community				
(Intercept)	3.69	0.01	307.18*	
Informational Support	5.2e ⁻³	1.4e ⁻³	3.65*	.35
Emotional Support	-3.4e ⁻³	1.3e ⁻³	-2.59*	-.25
Instrumental Support	-1.2e ⁻³	1.8e ⁻³	-0.65	-.06
Physical Comfort	8.2e ⁻⁴	1.8e ⁻³	0.46	.03
Perceived Control	-0.02	3.2e ⁻³	-6.62*	-.34
Info. Supp. × Control	-6.5e ⁻⁴	3.8e ⁻⁴	-1.72	-.17
Emo. Supp. × Control	1.4e ⁻⁵	3.5e ⁻⁴	0.04	.00
Instrum. Supp. × Control	1.0e ⁻³	4.9e ⁻⁴	2.12*	.19
Phys. Comf. × Control	-1.0e ⁻³	4.9e ⁻⁴	-2.09*	-.13
r ² = .17				

*p < .05

Table A19. Variance in Random Slopes for Different Types of Received Support Predicting Negative Mood

	<u>Student</u>	<u>Community</u>
	τ_{11} [95% CI]	τ_{11} [95% CI]
Informational Support	.06 [.02, .09]	.04 [.01, .09]
Emotional Support	.04 [.02, .07]	.10 [.06, .15]
Instrumental Support	.14 [.07, .22]	.20 [.10, .31]

Note. τ_{11} = variance in random slope.

Table A20. Mixed Effects Model Testing the Matching Hypothesis at the Social Level

Correlate	Unstandardized Coefficient	SE	df	t	r
Student					
(Intercept)	14.20	0.24	112	59.19*	
Perceived Control	-0.35	0.03	112	-6.07*	-.50
Informational Support	0.02	0.06	239	0.68	.04
Physical Comfort	0.12	0.02	977	4.84*	.15
Emotional Support	-0.08	0.04	117	-2.01*	-.18
Instrumental Support	-0.01	0.06	80	-0.26	-.03
Inform. Supp. × Perc. Control	-0.01	0.01	206	-0.83	-.06
Emo. Supp. × Perc. Control	0.01	0.01	121	1.42	.13
Instrum. Supp. × Perc. Control	-0.01	0.01	90	-0.87	.09
$r^2 = .09$					
Community					
(Intercept)	13.72	0.24	81	57.28*	
Perceived Control	-0.34	0.06	80	-5.36*	-.51
Informational Support	0.04	0.04	56	0.90	.12
Physical Comfort	0.20	0.03	536	6.25*	.26
Emotional Support	-0.15	0.05	30	-2.47*	-.41
Instrumental Support	-0.05	0.07	16	0.66	-.16
Inform. Supp. × Perc. Control	0.01	0.01	59	0.54	.07
Emo. Supp. × Perc. Control	-0.01	0.01	27	-0.06	-.01
Instrum. Supp. × Perc. Control	0.01	0.01	14	0.54	.14
$r^2 = .10$					

Table A21. Trait and Social Variance Components for Major Constructs

Source	Student		Community	
	$\hat{\sigma}^2$	% [95% CI]	$\hat{\sigma}^2$	% [95% CI]
Support Adequacy				
Trait influences	11.67	46 [38, 55]	5.83	28 [19, 34]
Social influences	10.96	44 [36, 51]	12.98	61 [55, 69]
Over-support				
Trait influences	3.60	57 [42, 74]	0.79	29 [18, 38]
Social influences	2.50	40 [24, 55]	1.79	67 [58, 79]
Under-support				
Trait influences	7.42	44 [34, 53]	4.87	30 [20, 37]
Social influences	9.20	54 [45, 63]	11.10	67 [58, 79]

Note. $\hat{\sigma}^2$ = raw variance component. % = percentage of total variance accounted for by each facet. CI = confidence interval. None of the 95% confidence intervals included zero.

Table A22. The Platinum Rule - Multivariate Generalizability Correlations

Variable	Support Adequacy	Over-support	Under-support	Positive Quality	Negative Quality	Positive Mood	Negative Mood
Support Adequacy							
Trait influences		-.42 [-.57, -.22]	-.94 [-.99, -.89]	.11 [-.09, .30]	-.23 [-.39, -.04]	.12 [-.06, .28]	-.23 [-.49, -.10]
Social influences		-.39 [-.47, -.31]	-.96 [-.99, -.93]	.26 [.16, .35]	-.41 [-.49, -.34]	.20 [.12, .28]	-.48 [-.55, -.41]
Over-support							
Trait influences	-.61 [-.71, -.51]		.04 [-.14, .21]	-.36 [-.49, -.23]	.12 [-.03, .26]	-.15 [-.23, -.03]	.32 [.11, .55]
Social influences	-.43 [-.51, -.35]		.00 [-.06, .06]	-.18 [-.26, -.07]	.21 [.13, .28]	-.19 [-.27, -.10]	.26 [.12, .39]
Under-support							
Trait influences	-.84 [-.92, -.74]	.06 [-.03, .16]		.02 [-.16, .21]	.20 [.01, .37]	-.07 [-.24, .10]	.21 [.01, .37]
Social influences	-.91 [-.96, -.87]	-.08 [-.15, -.02]		-.21 [-.30, -.11]	.36 [.28, .46]	-.14 [-.22, -.06]	.41 [.33, .49]
Positive Quality							
Trait influences	.23 [.13, .34]	-.30 [-.41, -.20]	-.08 [-.21, .04]		-.26 [-.09, -.46]	.47 [.35, .57]	-.14 [-.29, .01]
Social influence	.16 [.08, .24]	-.13 [-.20, -.06]	-.11 [-.03, -.19]		-.54 [-.62, -.47]	.67 [.62, .72]	-.39 [-.47, -.31]
Negative Quality							
Trait influences	-.29 [-.39, -.19]	.15 [.07, .25]	.26 [.14, .37]	-.31 [-.40, -.21]		-.23 [-.39, -.08]	.40 [.27, .53]
Social influences	-.27 [-.33, -.21]	.11 [.04, .19]	.24 [.16, .30]	-.49 [-.55, -.43]		-.47 [-.54, -.40]	.57 [.51, .64]
Positive Mood							
Trait influences	-.01 [-.11, .12]	-.17 [-.29, -.04]	.12 [.01, .22]	.43 [.31, .54]	-.24 [-.34, -.13]		-.02 [-.13, .13]
Social influences	.07 [-.01, .14]	-.06 [-.12, -.01]	-.04 [-.11, .03]	.56 [.51, .62]	-.32 [-.38, -.27]		-.29 [-.38, -.21]
Negative Mood							
Trait influences	-.49 [-.62, -.35]	.16 [.06, .28]	.50 [.33, .65]	-.30 [-.42, -.16]	.46 [.36, .53]	.12 [.03, .20]	
Social influences	-.19 [-.26, -.11]	.08 [.02, .16]	.17 [.07, .24]	-.17 [-.25, -.10]	.40 [.34, .46]	-.08 [-.15, .00]	

Note. Correlations for the student sample are presented below the diagonal; those for the community sample are presented above the diagonal. The confidence intervals of correlations in **bold** do not include zero.

APPENDIX B.

FIGURES

Figure B1. Venn diagram representing the variance components of the univariate $p : r \times i$ design. r = recipients, p = providers, i = items.

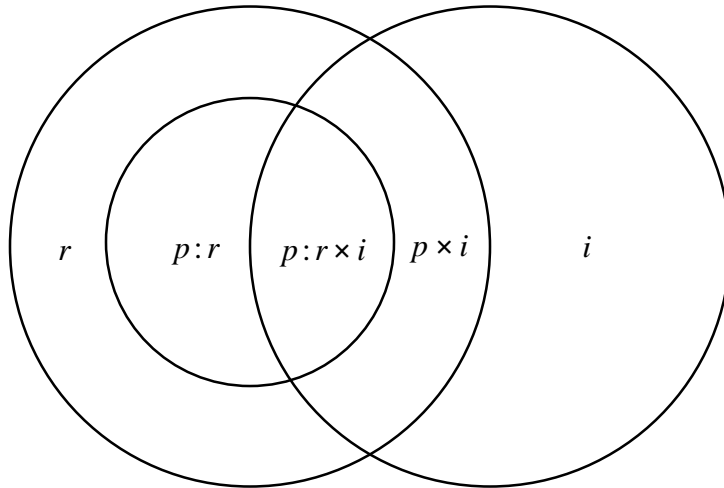


Figure B2. Venn diagram representing the multivariate $p^{\circ} : r^{\circ} \times i^{\circ}$ design. $r =$ recipients, $p =$ providers, $i =$ items, $v =$ variables.

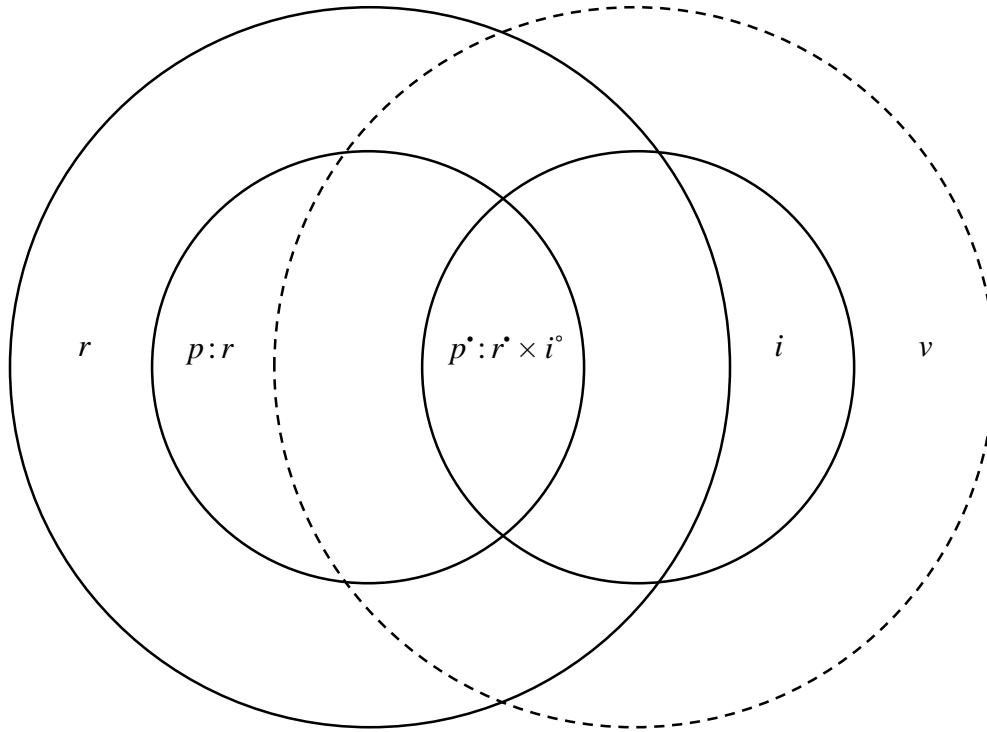


Figure B3. Simple Slopes Analysis for the Trait-level Association between Support Availability and Negative Mood Moderated by Life Adversity in the Community Sample. Low = low adversity, one standard deviation below the mean; Avg. = average adversity; High = high adversity, one standard deviation above the mean. * $p < .05$.

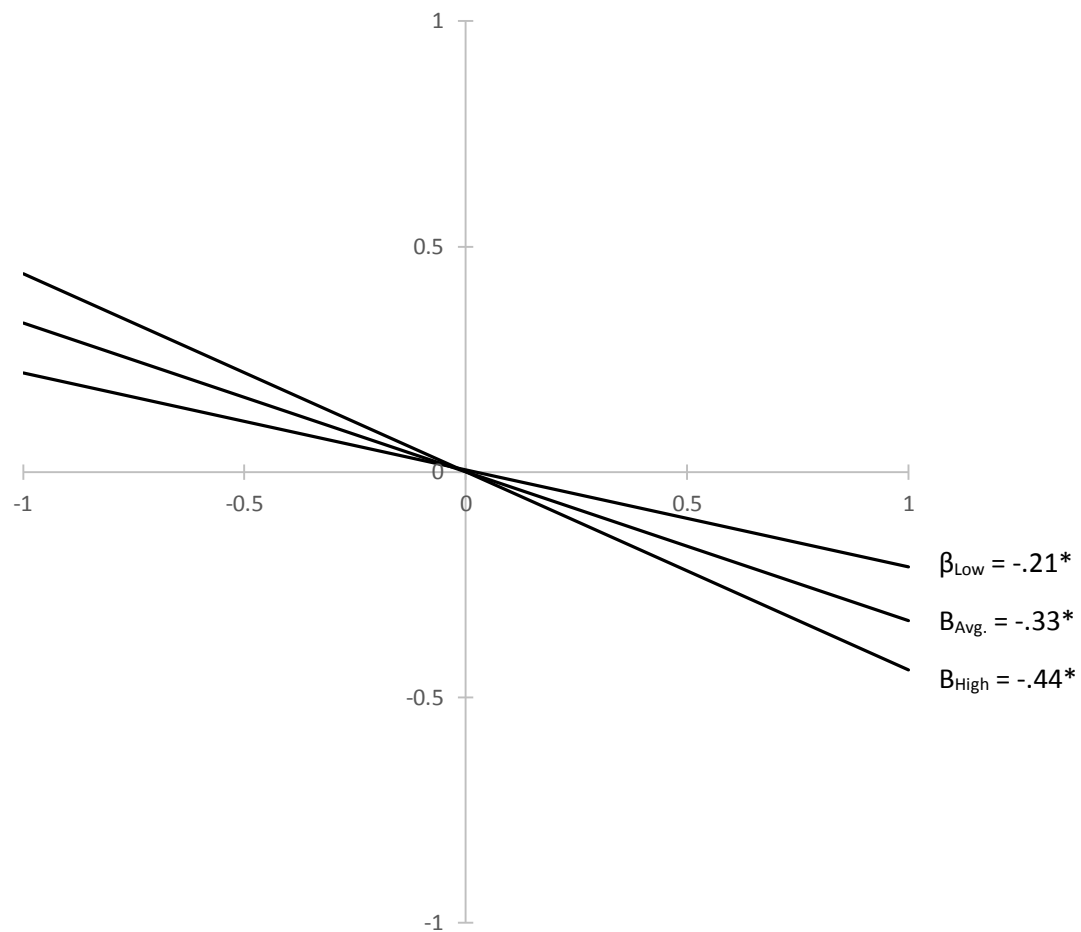


Figure B4. Simple Slopes Analysis for the Trait-level Association between Emotional Support and Negative Mood Moderated by Perceived Control in the Student Sample. Low = low control, one standard deviation below the mean; Avg. = average control; High = high control, one standard deviation above the mean. * $p < .05$.

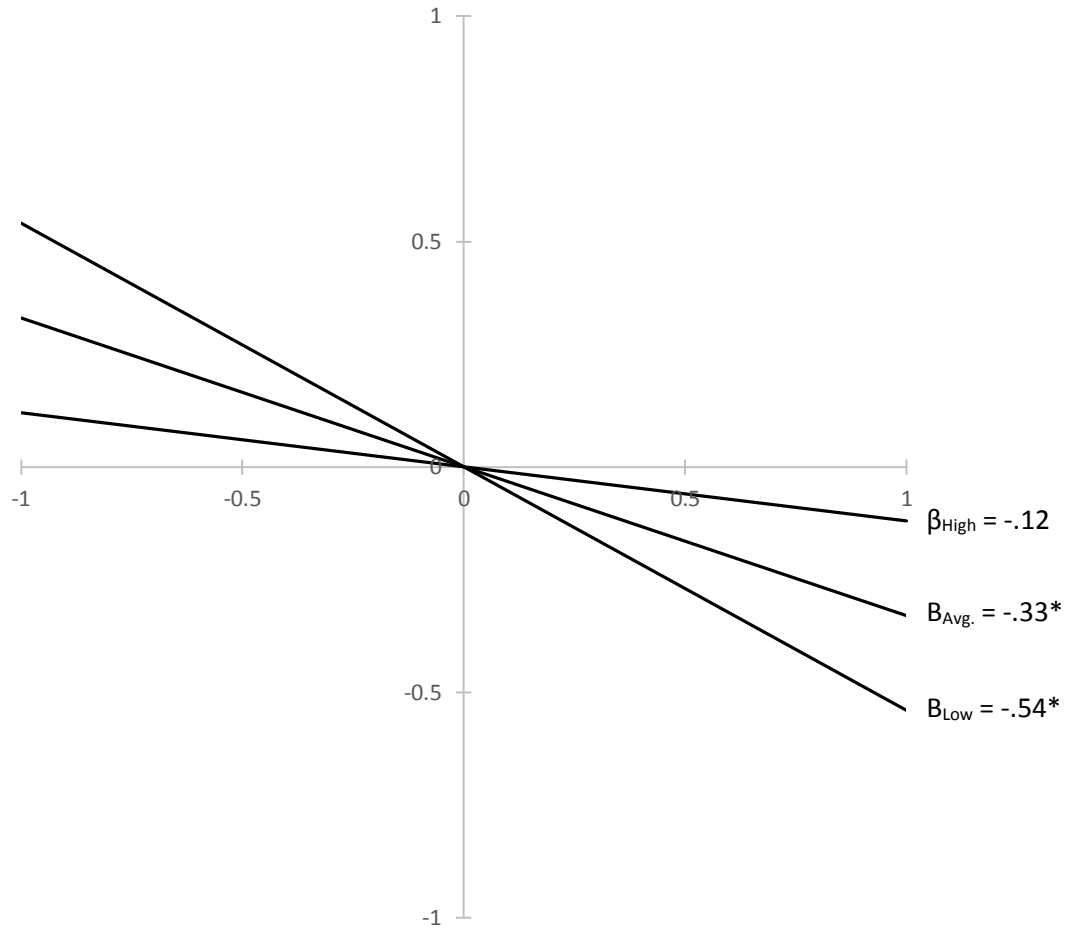


Figure B5. Simple Slopes Analysis for the Trait-level Association between Instrumental Support and Negative Mood Moderated by Perceived Control in the Student Sample. Low = low control, one standard deviation below the mean; Avg. = average control; High = high control, one standard deviation above the mean. * $p < .05$.

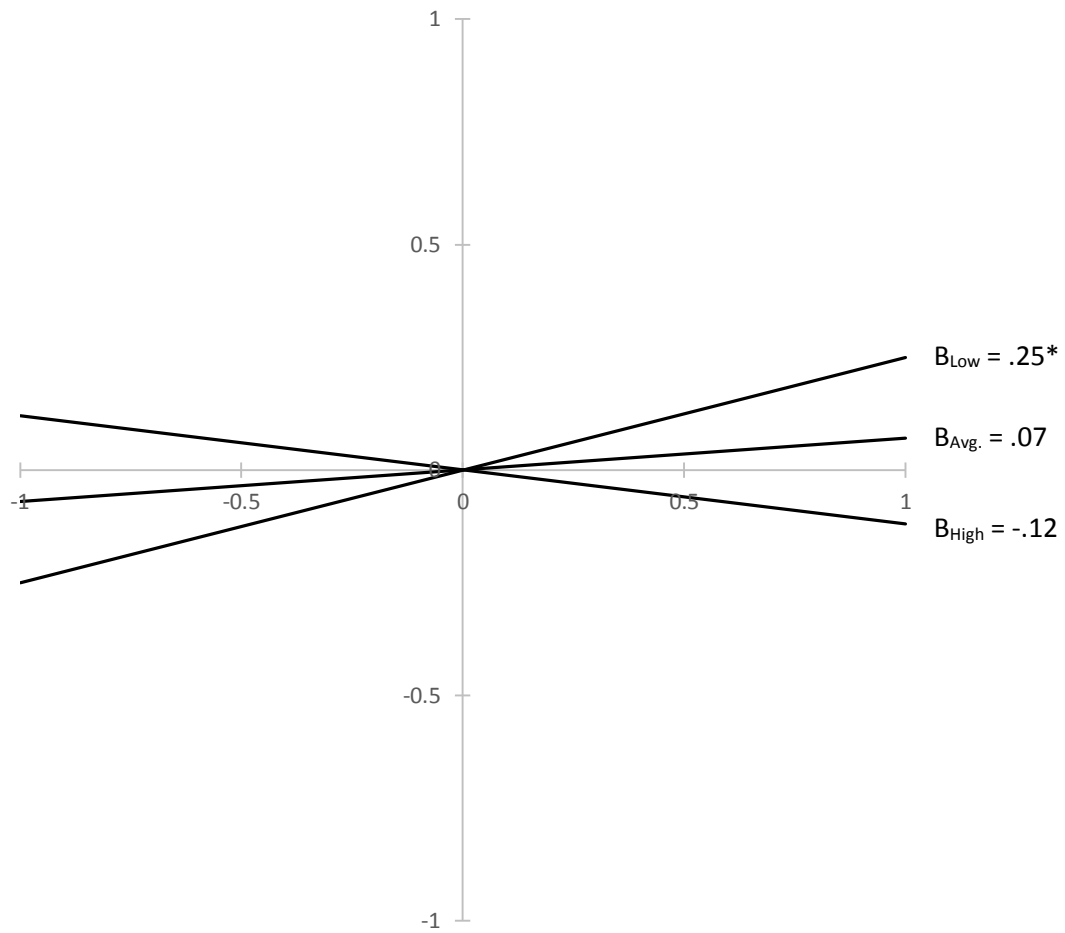


Figure B6. Simple Slopes Analysis for the Trait-level Association between Instrumental Support and Negative Mood Moderated by Perceived Control in the Community Sample. Low = low control, one standard deviation below the mean; Avg. = average control; High = high control, one standard deviation above the mean. * $p < .05$.

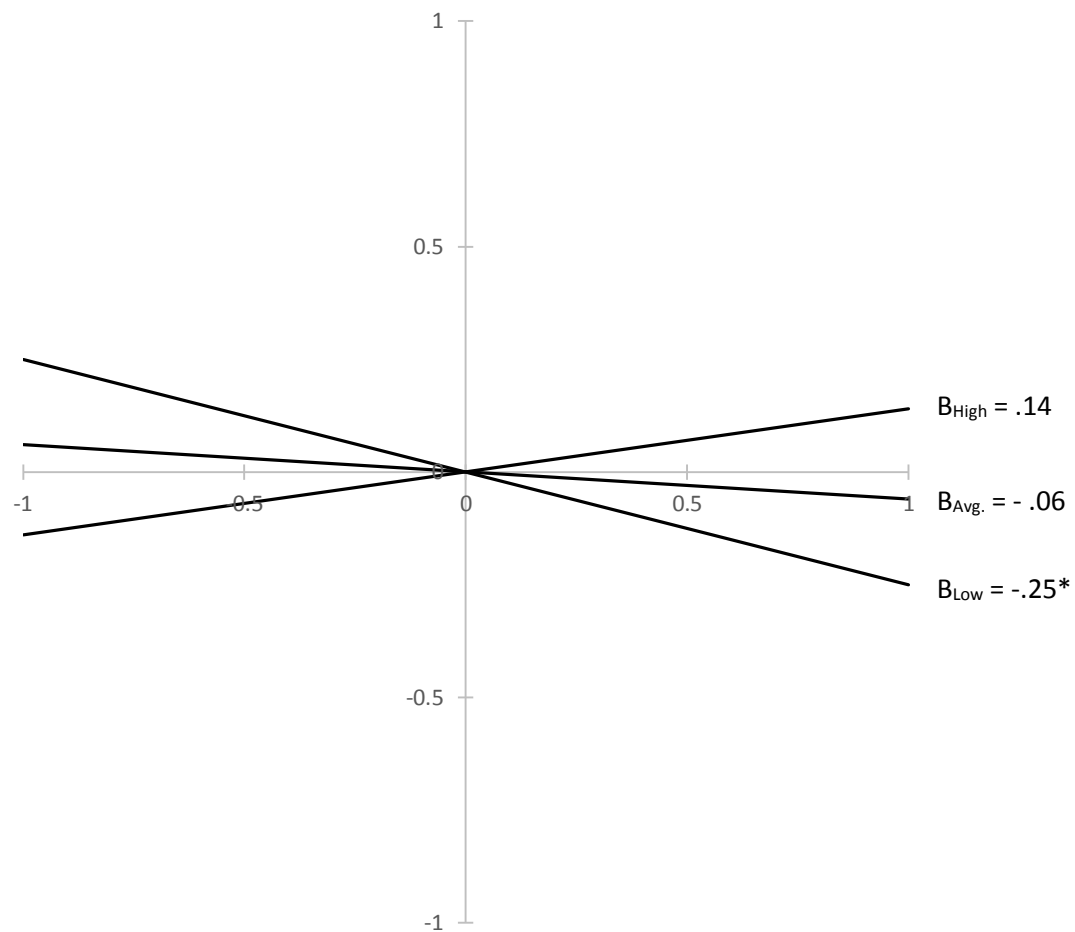


Figure B7. Simple Slopes Analysis for the Trait-level Association between Physical Comfort and Negative Mood Moderated by Perceived Control in the Community Sample. Low = low control, one standard deviation below the mean; Avg. = average control; High = high control, one standard deviation above the mean. No slopes were statistically significant.

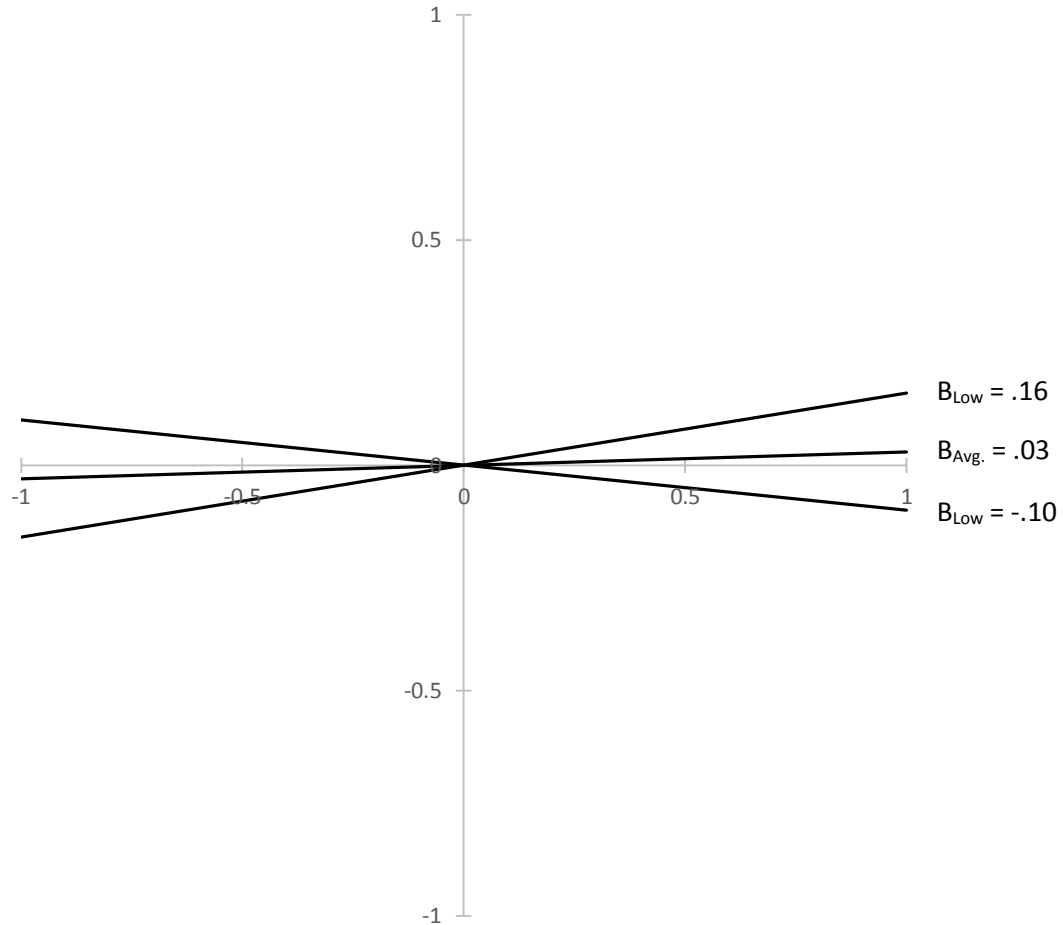
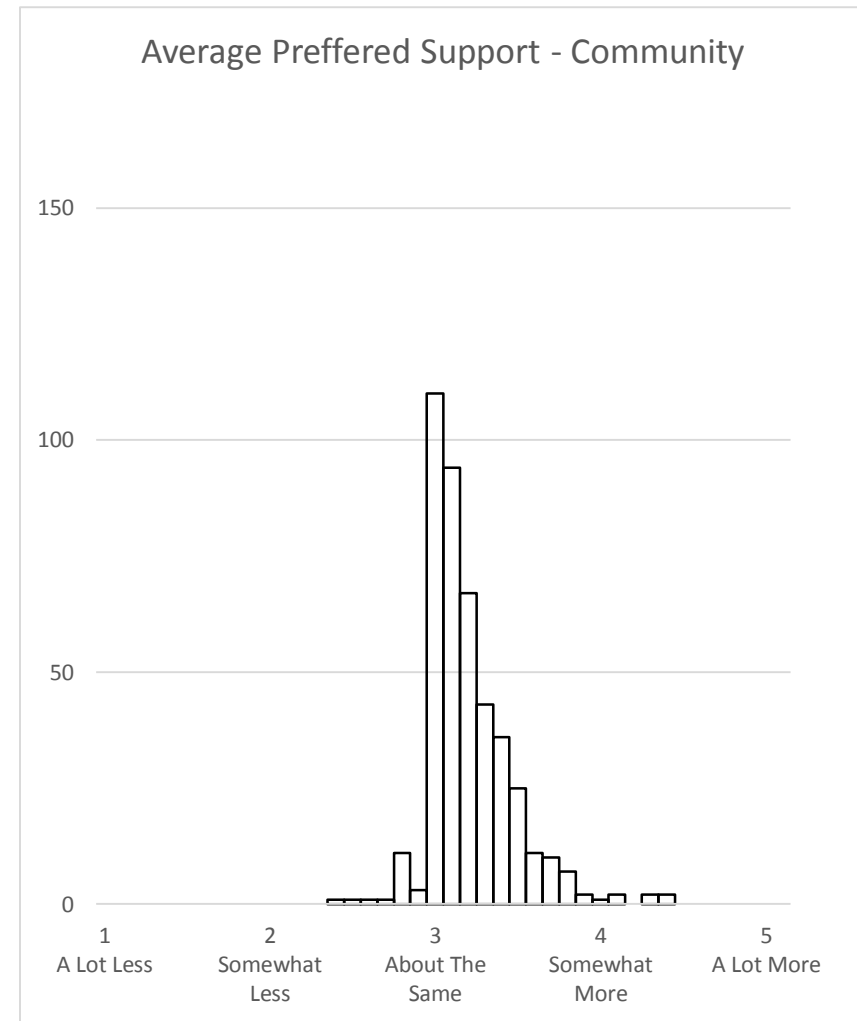
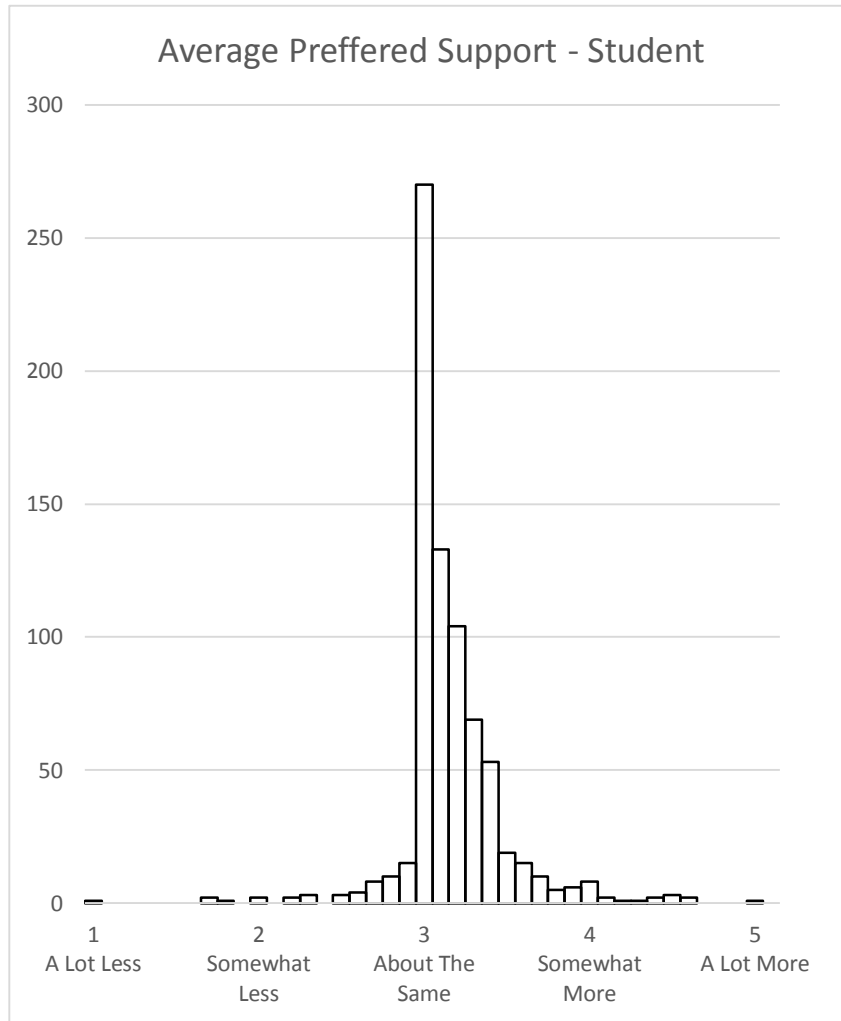


Figure B8. Average Preferred Support. Support preferences averaged across items and providers. Y axes scaled to reflect an equivalent proportion of recipients in each sample.



NOTES

$${}^1\alpha_r = \frac{\sigma_r}{\sigma_r + \sigma_{ri}/n_i}$$

$${}^2\alpha_{p:r} = \frac{\sigma_{p:r}}{\sigma_{p:r} + \sigma_{p:ri}/n_i}$$

$${}^3\hat{\sigma}_{\hat{\theta}}^* = [(\sum[\hat{\theta}_b^* - \hat{\theta}_{(.)}^*]^2)/(B - 1)]^{1/2}$$

$${}^4AVE = \frac{\sum_{i=1}^n \lambda_i^2}{n}$$

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