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Toward Refining the Stress-Buffering Model: Comparing Social Support and Friendship Satisfaction

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ABSTRACT OF THE THESIS

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By

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Social relations may provide young adults with both direct health benefits and indirect benefits by mitigating stress. Research on social relations generally has focused on the benefits of social support, and little is known about whether having satisfying friendships, independent of receiving social support, may confer benefits to mood and health. In this study, survey data from 1,851 undergraduates was analyzed to determine whether social support and friendship satisfaction have a direct or moderated relationship with mental (e.g., anxiety and depressive symptoms) and physical health (e.g., number and frequency of physical symptoms). Results suggested that both friendship satisfaction and social support made independent contributions to mental and physical health, but friendship satisfaction was more consistently and strongly associated with the outcome measures than was social support. Although stress—both overall and academic- specific—was associated with poorer mental and physical health, individuals with high levels of social support or friendship satisfaction were protected from some of the associations between stress and mental health. Results highlight the importance of both social support and friendship satisfaction in the lives of college students and suggest that friendship satisfaction may be an important pathway through which social ties influence psychological well-being and health.

Toward Refining the Stress-Buffering Model: Comparing Social Support and Friendship Satisfaction

Chapter 1: Introduction

The college years constitute an exciting, and often uniquely challenging, period in many young people's lives. A majority of youth will move away from home or spend far less time at home, and thus will experience greater independence from their family than in the past. In addition, college students often take on significant new responsibilities, such as living with nonfamilial peers, managing their finances, and balancing competing social and academic demands without parental supervision (Ross, Niebling, & Heckett, 1999). Going to college involves making new friends and adapting to new, typically more rigorous, academic standards. In short, the college years, and especially the transitional freshman year, are replete with stressful circumstances. Indeed excessive stress is a growing public health concern on college campuses with greater numbers of students reporting high levels of stress than in the past (Pryor, Hurtado, Blake, & Tran, 2011). The price of stress can be costly; high stress levels are associated with increased rates of psychological problems and physical illness, along with decreased life satisfaction (Bailey & Miller, 1998; Dyson & Renk, 2006; Edwards, Hershberger, Russell, & Markert, 2001).

Among the factors that may provide an antidote to, or relief from, the multiple pressures of college students' lives and contribute to their well-being are social relationships. Prospective epidemiological studies, laboratory experiments with animals and humans, and cross-sectional research have corroborated the various positive physiological and psychological rewards of social relationships, as well as the detrimental effects of social isolation (Baumeister, Brewer, Tice, & Twenge, 2007; Cohen, 2004; House, Landis, & Umberson, 1988; Uchino, Cacioppo, &

Kiecolt-Glaser, 1996). Social relationships may provide direct health benefits as well as indirect benefits, the latter by preventing or reducing the impact of stressful situations on psychological and physical well-being (Cohen & Wills, 1985). Although research has focused mainly on the benefits of social support, other aspects of social relationships, such as satisfying activities and interactions with friends that do not involve support also may be consequential for college students' well-being.

Social Support

Although positive relationships with others are thought to influence health through a variety of mechanisms, psychologists have focused mainly on the benefits of social support (House et al., 1988), assessed most frequently in terms of emotional dimensions such as caring, concern, and encouragement. This emotion-oriented type of support, typically provided by a handful of close friends or family members, may reduce negative cognitive, affective, and behavioral responses to stress by providing an outlet for individuals to share their thoughts and concerns (Cohen, Underwood, & Gottlieb, 2000). Indeed, Rimé, Philippot, Boca and Mesquita (1992) concluded that 90% of people who have experienced a negative life event discuss it with another person, usually shortly after the event. Individuals without confidants have fewer opportunities for emotional disclosure (Lepore, Silver,Wortman,&Wayment, 1996). Social support has been shown to reduce the negative consequences of serious negative life events, such as loss of a close family member, and also to diminish the impact of minor, day-to-day hassles and upsets (Thoits, 2011). In summary, social support is often beneficial, in that it can mitigate both major stressors and daily hassles by providing understanding and comfort.

Empirical evidence for the benefits of social support as a stress buffer has been mixed, however, with many studies failing to find the predicted indirect effects (Lakey & Orehek, 2011). Support group interventions designed to increase support among individuals in high-stress situations (e.g., patients with cancer) have yielded inconsistent health benefits (Hogan, Linden, & Najarian, 2002). These mixed findings may occur because, in addition to its well-documented benefits, social support sometimes incurs psychological "costs," such as feelings of incompetence or indebtedness (Bolger & Amarel, 2007). For some individuals and in some situations, social support can even be harmful. For example, stress may be exacerbated when the provider and receiver of social support engage in co-rumination (Rose, 2002).

Friendship Satisfaction

As a consequence of researchers' focus on the provision of social support by significant others, other aspects of social relationships that might provide direct and stress-buffering benefits to health and well-being often have been overlooked (Berkman, Glass, Brissette, & Seeman, 2000; Felton & Shinn, 1992). However, prospective epidemiological studies that examine the health benefits of social relationships have shown that social integration (i.e., the size and density of one's social network) is a powerful predictor of future health (e.g., Berkman, 1995). Individuals who are socially integrated participate in social activities such as spending time with friends, attending social functions, and joining organized groups. Berkman and colleagues (2000) argued that these types of social interactions, which they refer to as friendship satisfaction, influence health through mechanisms other than social support—for instance, by providing sources of companionship and feelings of attachment to one's community.

In contrast to social support, the relationship processes that are involved in friendship satisfaction and companionship with others are not thought to exert buffering effects, but rather

to provide health benefits regardless of stress level (Cohen et al., 2000). This belief stems from early sociological work that found that the number of social contacts was predictive of health regardless of stress- level (Cohen & Wills, 1985). However, individuals' perceptions of the quality of their social relationships–i.e., the degree of satisfaction they experience in their friendships–may be a more meaningful and accurate way of assessing the benefits of friendship satisfaction than measures of social network size or composition. Social relationships also may be a source of strain that is detrimental to well-being, as previously mentioned. In fact, Rook (1984) reported that negative social interactions were more strongly related to well-being than were positive social interactions (Rook, 1984).

Various aspects of social relationships may provide health benefits by serving as stress buffers, albeit through different mechanisms than social support. For example, interacting with friends can serve as a distraction and thus provide temporary relief from stressors (Hutchinson, Loy, Kleiber, & Dattilo, 2003). Engaging in pleasurable leisure activities with others can reduce feelings of distress and increase a sense of well-being following a stressful life event (Wheeler & Frank, 1988). Positive social experiences can be mood enhancing and increase feelings of optimism that may help individuals cope with stressful situations (Hutchinson et al., 2003). Among adults caring for their elderly relatives, social interaction with friends and family was not only more important than social support in relieving caregiving burden, but social support was, in fact, largely ineffectual (Thompson, Futterman, Gallagher-Thompson, Rose, & Lovett, 1993). Similar results were found in a daily diary study of police officers; companionship buffered the negative effects of mood deriving from work stress, but social support did not (Buunk & Verhoeven, 1991). Finally, Rook (1987) found that companionship buffered the association

between minor life events and well-being; however, companionship did not protect individuals experiencing major life events.

College Students and Friendship Satisfaction

Both social support and other aspects of social relationships have been shown to benefit the health and well-being of college students. Social support has been found to be positively related to well-being and adjustment to college (Abbey, Abramis, & Caplan, 1985; Hertel, 2002). Also, merely participating in common activities with friends has emerged as a significant predictor of academic success, including retention from freshman to sophomore year (Swenson Goguen, Hiester, & Nordstrom, 2010). To cite one additional example, Skahill (2002) found that students who made a greater number of friends upon entering college were more likely to report attaining their academic goals than were students who made fewer friends.

Although, research indicates that social support and satisfaction with friends are associated with health, well-being, and success in college, few studies have examined their relative influence. Whereas both aspects of social relationships may be beneficial to college students' well-being, having high-quality friendships may be especially important inasmuch as it may provide a sense of attachment and "belonging" in challenging academic environments. Indeed, individuals who are socially integrated at their college are less likely to drop out than are their less integrated peers (Hausmann, Schofield, & Woods, 2007). Bolger and Eckenrode (1991) found that, after adjusting for overall perceived social support, individuals who interacted with a greater number of friends were less likely to show increases in anxiety during medical school examinations than were individuals who had fewer friends. Moreover, social support did not act as a stress buffer after adjusting for number of friends (Bolger & Eckenrode, 1991). Having satisfying friendships may be more beneficial than receiving social support from others for two

reasons. First, the enactment of friendships (e.g., in shared activities or conversations) and the experience of satisfaction in one's ongoing relationships with friends are threaded through the fabric of everyday life, whereas social support is needed and enacted mainly in times of stress or crisis. Second, because friendships are engaged in by mutual consent, they may not lead to concerns about burdening others or feelings of indebtedness.

The Present Study

As a step toward refining the stress-buffering model, the present study compared the direct and indirect effects of *social support* and *friendship satisfaction* on college students' health and well-being in a diverse sample of college students. Based on the prior literature, we expected to see main effects for both aspects of social relationships (Hypothesis 1). However, we expected the associations between friendship satisfaction and well-being to be stronger than those between social support and well-being. We also examined the relationships of social support and friendship satisfaction to two types of stress, *overall stress* and *academic stress*. We expected both social support and friendship satisfaction to moderate (i.e., buffer) the associations between well-being and both types of stress (Hypothesis 2).

Chapter 2: Method

Participants

A total of 1,870 undergraduates attending a large public university in California completed a web-based survey as part of a larger research project (University Health and Behavior Study or U-HAB) during the winter quarter of 2011. This project originally was designed to assess factors that are associated with student health and participation in risky behaviors. Analyses were restricted to the 99% of students who were under the age of 29. Females comprised 65% of the resultant sample of 1,851 undergraduates, and ages ranged from 18-29 (M=19.92, SD=2.5). The distribution of the sample across year in school was as follows: 39% freshmen, 18% sophomores, 24% juniors, 16% seniors, and 3% 5th year students, e.g., students pursuing a double major. With respect to educational attainment, 7% of participants' fathers and 8% of mothers did not have a high school diploma; 38% of fathers and 42% of mothers had graduated from high school; and 55% of fathers and 50% of mothers had earned at least a 4-year college degree. The sample was ethnically diverse, with Asian Americans (*N* = 948) constituting 51% of the sample; Caucasians (*N*= 433), 23% of the sample; and Mexican/Latino Americans (*N* = 205), 11% of the sample. The sample also included African Americans (*N* = 26; 1.4%), Middle Eastern Americans (*N* = 62; 3.3%), Native Americans (*N* = 7; 0.4%), Pacific Islander Americans (*N* = 43; 2%), Multi-Ethnic Americans (*N* = 57; 3%), and Prefer not to answer (*N* =70; 4%).

Procedures

Participants were recruited from the entire undergraduate student body using email addresses provided by the campus registrar (*N*=17,773). Email invitations to complete the online

U-HAB survey were sent successfully to 99.7% of these students (*N*=17,718). A total of 1,870 students participated, a response rate of 10.6%. The demographic characteristics of the resultant sample (e.g., academic major and ethnicity) roughly mirrored these characteristics of the student body as a whole. The main exceptions were that the study sample was younger (mean age 20 years for the sample vs 22 years for the whole population) and had more female respondents than the overall student population (65% vs 54%). Because of these differences, age and sex were treated as control variables in the study.

Students who chose to participate provided informed consent by checking a radio box on an online form, indicating that they had read the study information sheet and were ready to participate in the study. The U-HAB survey was administered entirely online and took roughly 20-30 minutes to complete. As partial compensation for their involvement, participants were entered into a raffle for one of 20 prizes, which included an iPod, a Trader Joe's gift bag filled with groceries, t-shirts, and gift certificates to local establishments.

Measures

Demographics. Participants reported their, age, gender, parental education, year in school, and ethnicity. Parental education (assessed for both mother and father) was described by means of a 7-point variable, ranging from "some high school" to "MD, JD, Ph.D or equivalent." Participants were asked to indicate their year in school as freshman, sophomore, junior, senior, or fifth-year student or beyond. Participants also were asked to indicate their ethnic identity by selecting their ethnic/cultural background from a list of the following ethnic designations: Asian, Black or African, Latino/a, Middle Eastern, Native American, Pacific Islander, White (non-Hispanic), or Other. Individuals who selected "Other" were asked to type in their ethnic

background. Their responses then were either recoded into one of the aforementioned seven ethnic categories (e.g., the response, "Chinese," was recoded as "Asian"); or categorized under an additional rubric, "Multi-Ethnic," as in the case of the response, "White and Chinese." Responses from two students could not be placed in one of the categories and thus were classified as "Prefer not to answer."

Overall stress. Participants responded to the 4-item Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) regarding the frequency of stressors over the past four weeks. Responses were made using a 5-point Likert scale ranging from 0 (*neve*r) to 4 (*very often*). A sample question is, "How often have you felt like you were unable to control the important things in your life?" The two positively-worded items were reverse-coded, and the four items were summed and averaged to create a composite score with higher scores reflecting a higher level of stress. In this study, coefficient alpha for the scale was .77.

Academic stress. Participants' concerns regarding their academic performance were assessed with a 4-item subscale from the Academic and Social Concerns Scale (Rabiner, Anastopolous, Costello, Hoyle, & Swartzleder, 2008). Responses were made on a 5-point Likert scale ranging from 1 (*strongly disagree)* to 5 (*strongly agree)*. A sample item is, "I feel as though I will not be as successful academically as I should be." Two items were framed positively and were reverse-scored. Responses were summed and averaged to create a composite score with higher scores reflecting a higher level of stress. Coefficient alpha for this scale was .80.

Social support. Participants reported their perceived level of social support using a 9-item version of the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Powell,

Farley, Werkman, & Berkoff, 1990). Items on this scale refer to perceived levels of support from three sources—family, friends, and another, significant person in one's life, each scale consisting of 3 items. Responses were made on a 7-point Likert scale ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*). A sample item is, "I have friends with whom I can share my joys and sorrows." Responses were summed and averaged to create a composite score for the nine items. Coefficient alpha for this scale was .91.

Friendship satisfaction. Participants' satisfaction with their social life was measured with the relevant 4-item subscale from the Academic and Social Concerns Scale (Rabiner et al., 2008). Items on this scale evaluate the quality of a person's social life and friendships without explicitly referring to support. A sample item is, "I feel satisfied with the quality of my social life." Responses were made on a 5-point Likert scale ranging from 1 (*strongly disagree)* to 5 (*strongly agree).* The two negatively-worded items were reverse-scored. Responses were summed and averaged to create a composite score with higher scores reflecting a higher level of friendship satisfaction. Coefficient alpha for this scale was .77.

Depressive symptoms. Symptoms of depression were assessed using the 7-item short form of the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977; see Dooley, Prause, & Ham-Rowbottom, 2000 for an example where the 7-item version has been used)). The CES-D examines depressive symptoms and negative affect over the past 7 days. Participants responded using a 5-point scale ranging from 1= *never to* 5= *most of the time*. A sample item is, "My sleep was restless." Responses were summed and averaged to create a composite score with higher scores reflecting a higher level of depressive symptoms. Coefficient alpha in the present study was .82.

Anxiety. Symptoms of anxiety were assessed using the 7 anxiety items from the Hospital Anxiety and Depression Scale (HADS; Zigmond, & Snaith, 1983). Participants rated the frequency of anxiety-relevant thoughts, feelings, and behaviors that had occurred over the past week on a 4-point scale ranging from 0 (*rarely*) to 3 (*most of the time).* A sample item is, "I feel tense or wound up." The one positively worded item was reverse-scored. Responses were summed and averaged to create a composite score with higher scores reflecting a higher level of anxiety. Coefficient alpha for the scale in this study was .83.

Physical symptoms. Eight items assessing physical symptoms that were deemed most relevant to the lives of college students were extracted from the Child Health and Illness Profile: Adolescent Edition (CHIP-AE; Starfield et al., 1993). These items assessed the approximate number of days during which participants experienced physical symptoms such as aches, pains, and tiredness over the preceding 4 weeks. Responses were made on a 5- point Likert scale ranging from 1= *no days* to 5= *15-28 days*. A sample item is, "How many days did you wake up feeling tired?" Two items were framed positively and were reverse-scored. Responses were summed and averaged to create a composite score with higher scores reflecting a higher level of symptoms. Coefficient alpha for this scale was .74.

Chapter 3: Results

Descriptive Analyses

Table 3.1 presents the means, standard deviations, and intercorrelations for the key study variables. As expected, stress, depressive symptoms, anxiety, and physical symptoms were substantially intercorrelated, with correlations ranging from .42 -.70. Correlations between other variables were lower, ranging from .13 - .45. Of particular note, the correlation between social support and friendship satisfaction, although significant, was moderate in magnitude (r = .46, p <.001).

Table 3.1

Summary of Intercorrelations, Means, and Standard Deviations Among Key Variables (N = 1426-1626)

Measure	1	2	3	4	5	6	7	*M (SD)*
1. Stress	—	.45***	-.30***	-.48***	.59***	.56***	.42***	2.61 (.78)
2. Academic Concerns		—	-.14***	-.25***	.33***	.36***	.25***	3.18 (.89)
3. Social Support			—	.46***	-.26***	-.20***	-.13**	5.42 (1.19)
4. Friendship Satisfaction				—	-.43***	-.37***	-.29***	3.75 (.80)
5. Depressive Symptoms					—	.70***	.51***	1.85 (.63)
6. Anxiety						—	.48***	1.86 (.62)
7. Physical Symptoms							—	2.24 (.68)

*p < .05 **p < .01 *** p < .001

Plan of Analysis

Hierarchical regression analyses were conducted for each of the three outcome variables. Regression models were estimated using full-information maximum likelihood (FIML) in STATA 12. FIML estimation retains participants with any available data and has been shown to produce estimates that are less biased and more efficient than other missing data methods (e.g., listwise deletion; see Enders & Bandalos, 2001). To address issues of multicollinearity, all interaction terms were centered. In step 1, we entered the following attributes as control variables: gender, participants' year in school (recoded as freshman vs. other in order to contrast the presumed most stressful year of transition to college with the other years), parental education (one dichotomous variable indicating whether or not the participant is a first-generation college student), and ethnicity (dummy coded as Asian American, Latino American, and Other versus Caucasian), with "Other" comprised of smaller groups of other ethnicities, as noted in the previous section on demographics. We did not include participants' age, because year in school can serve a dual purpose as a proxy for age and a marker of "developmental stage" in college. In step 2, we entered overall stress and academic stress, and in step 3, we added social support and friendship satisfaction to the model. In order to examine whether social support and friendship satisfaction buffer individuals from the effects of stress, the interactions between social relationships (i.e., social support and friendship satisfaction) and stress (i.e., overall stress and academic stress) were entered into the model one at a time in step 4. In other words, a total of four interaction terms were entered separately in this last step. The final model for the three outcome variables (depressive symptoms, anxiety, and physical symptoms) can be seen in Table 3.2a and Table 3.2b.

Main Effects

Hypothesis 1 predicted that social support and friendship satisfaction each would have main effects on depressive symptoms, anxiety, and physical symptoms. For depressive symptoms, we found significant main effects for both social support and friendship satisfaction, as expected; however, the association was much stronger for the latter. As can be seen in Table 3.2a, the standardized regression coefficient for friendship satisfaction (β = -.18) was approximately three times greater than it was for social support (β = -.05). For anxiety, the predicted main effect was found only for friendship satisfaction, b = -.10, z = -4.90, p < .001.

Table 3.2a

Regressions of Well-being and Health on Stressors and Social Relationships

Step	Predictor Variables	Outcome Variables											
		Depressive Symptoms				Anxiety				Physical Symptoms			
		b(SE)	β	ΔR²	Adj R²	*b*(SE)	β	ΔR²	Adj R²	*b*(SE)	β	ΔR²	Adj R²
1.	Gender[a]	.04 (.03)	.03			.08 (.03)**	.06			.10(.03)**	.07		
	Freshman	.04 (.03)	.03			.01 (.03)	.005			.03 (.03)	.02		
	Parental Education[b]	.02 (.03)	.01			.03 (.03)	.02			.02 (.04)	.01		
	Asian[c]	-.10 (.03)**	-.08			-.09 (.03)**	-.07			-.19 (.04)***	-.14		
	Latino[c]	-.02 (.05)	-.01			.03 (.05)	.02			-.13 (.06)*	-.06		
	Other[c]	.01 (.04)	.01			.04 (.05)	.02			-.05 (.05)	-.03		
				—	.01*			—	.02***			—	.02***
2.	Overall Stress	.36 (.02)***	.45			.34 (.02)***	.44			.28 (.02)***	.32		
	Academic Stress	.06(.02)***	.08			.09 (.02)***	.12			.07 (.02)***	.09		
				.34***	.34***			.33***	.34***			.17***	.19***
3.	Social Support	-.03 (.01)*	-.05			-.01 (.02)	-.02			.01 (.02)	.01		
	Friendship Satisfaction	-.14 (.02)***	-.18			-.10 (.02)***	-.13			-.11 (.02)***	-.13		
				.04***	.37***			.02***	.36***			.01***	.20***

[a]Gender was dummy coded, 0=male, 1=female. [b]Parental education was dummy coded, 0 = first-generation college student 1 = At least one parent has a college education.
[c]Caucasian Americans were the reference group.
$^{\dagger}p$ = .06 $^{*}p$ < .05 $^{**}p$ < .01 $^{***}p$ < .001

Similarly, for physical symptoms, only the main effect for friendship satisfaction was significant, b = -.11, z = -4.66, p <.001.

Stress-buffering Effects

Hypothesis 2 predicted that both social support and friendship satisfaction would moderate the association between stress and well-being. For depressive symptoms, only the Overall Stress X Friendship Satisfaction interaction was significant, b = -.08, z = -4.15, p <.001, indicating that the relationship between overall stress and depressive symptoms was moderated by high levels of friendship satisfaction. Our analysis of the simple slopes revealed that the

Table 3.2b

Regressions of Well-being and Health on Stressors and Social Relationships

Step	Predictor Variables	Outcome Variables											
		Depressive Symptoms				Anxiety				Physical Symptoms			
		b(SE)	β	ΔR²	Adj R²	*b*(SE)	β	ΔR²	Adj R²	*b*(SE)	β	ΔR²	Adj R²
4[d]	Overall Stress X Social Support	-.02 (.01)	-.02			-.03(.01)[†]	-.04			-.01 (.02)	-.01		
				.00	.37***			.003	.36***			.00	.20***
	Overall Stress X Friendship Satisfaction	-.08 (.02)***	-.08			-.04 (.02)*	-.05			-.003 (.02)	-.00		
				.01***	.38***			.002	.36***			.00	.20***
	Academic Stress X Social Support	-.02 (.01)	-.04			-.04 (.01)***	-.08			-.01(.02)	-.01		
				.002	.37***			.01***	.37***			.00	.20***
	Academic Stress X Friendship Satisfaction	-.03 (.02)	-.03			-.03 (.02)[†]	-.04			-.01(.02)	-.01		
				.003	.37***			.003	.37***			.00	.20***

[d] Interaction terms were entered one at a time into the model.
[†] p = .06 *p < .05 **p < .01 ***p < .001

association between overall stress and depressive symptoms for individuals who reported low levels (i.e., 1 *SD* below the mean) of friendship satisfaction was significant, b = .40, z = 14.42, p < .001. For individuals who reported high levels (i.e., 1 *SD* above the mean) of friendship

satisfaction, this relationship, although attenuated, remained significantly different from zero, b = .29, z = 10.48, p < .001. Thus, for depressive symptoms, friendship satisfaction appeared to buffer the effects of overall stress. This effect was not mirrored for academic stress, and no buffering effects emerged for social support.

Results for anxiety provide some support for our hypothesis. The Overall Stress X Social Support interaction was significant, b = -.03, z = -2.00, p =.045, and the Overall Stress X Friendship Satisfaction interaction was significant b = -.04, z = -2.31, p =.02. As depicted in Figure 3.1, social support and friendship satisfaction moderated, but did not eliminate, the relationship between overall stress and anxiety. The association between overall stress and anxiety was significant for individuals with low levels of social support, b = .38, z = 13.59, p < .001, or friendship satisfaction, b = .38, z = 13.71, p < .001, and remained significant for individuals with high levels of social support, b = .31, z = 11.29, p < .001, or friendship satisfaction, b = .30, z = 11.19, p < .001. The Social Support X Academic Stress interaction was significant, b = -.04, z = -3.74, p < .001. This association between academic stress and anxiety was significant for individuals with low levels of social support, b = .15, z = 6.23, p < .001. However, for individuals with high levels of social support, the interaction was not significant, b = .04, z = 1.51, p = .13. Finally, the Academic Stress X Friendship Satisfaction interaction was marginally significant, b = -.03, z = -1.93, p =.054. Although this interaction was not statistically significant, the direction of these results was as predicted with high levels of friendship satisfaction appearing to buffer the association between academic stress and anxiety.

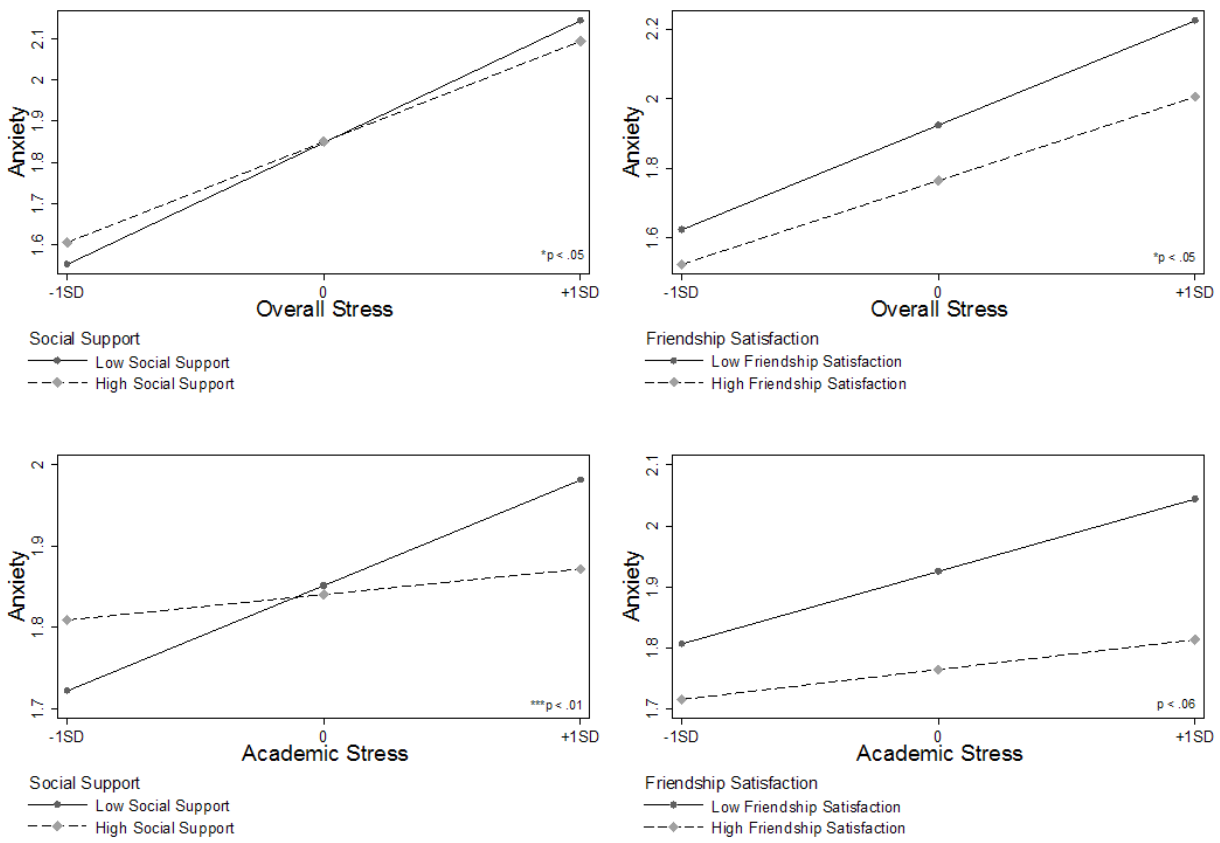

Figure 3.1. Social support and friendship satisfaction moderate the association between stress and anxiety.

Thus, both friendship satisfaction and social support appeared to buffer the association between overall stress and anxiety. Social support also appeared to buffer the association between academic stress and anxiety and friendship satisfaction exhibited a marginally significant trend toward buffering the association between academic stress and anxiety. Finally, for physical symptoms, contrary to expectations, neither aspect of social relationships served to buffer participants from the negative impact of overall or academic stress.

Additional Findings

Although gender, year in school, parental education, and ethnicity were included as control variables in our analysis, it is nonetheless of some interest to describe the associations of these demographic variables with our three measures of well-being. As in many other studies, females reported somewhat higher levels of anxiety (see Bayram & Bilgel, 2008) and physical symptoms (see Unruh, 1996) than did male students. Of the three ethnic groups, only Asian ethnicity was associated consistently with the outcome measures. Asian American participants reported somewhat lower levels of depression, anxiety, and physical symptoms than did Caucasians. Latino Americans reported significantly fewer physical symptoms than did Caucasians. Taken together and controlling for other variables in the model, demographic variables accounted for a small, but significant proportion of the variance in depressive symptoms, anxiety, and physical symptoms (see Table 3.2).

Chapter 4: Discussion

Research on social relationships has focused mainly on the benefits of social support and has tended to overlook other potentially important aspects of social relationships that might contribute to health and well-being. This study examined friendship satisfaction, in addition to social support, and investigated their relative contribution to college students' psychological health and physical well-being. We also examined the ability of social support and friendship satisfaction to buffer the detrimental effects of two types of stress (overall and academic) on three domains: depressive symptoms, anxiety, and physical symptoms.

Our results indicated that friendship satisfaction may be particularly important for college students. As predicted, friendship satisfaction was consistently and strongly associated with mental health and physical symptoms. In contrast, social support contributed independently to depressive symptoms but was not significantly associated with anxiety or physical symptoms. Indeed, the correlation between friendship satisfaction and physical symptoms (r = -.29) was significantly greater than the correlation between social support and physical symptoms (r = -.13). It may be the case that social support is beneficial mainly for individuals who are experiencing relatively severe stressors or major life events, whereas friendship satisfaction may more generally benefit health and well-being. In fact, Rook (1987) reported that companionship had a positive association with well-being and buffered the association between minor life events and well-being, whereas social support buffered the association between major life events and well-being. Future research should explore whether social support might be more beneficial than friendship satisfaction under certain circumstances.

Stress, both overall and academic-specific, was associated with poorer mental and physical health. However, individuals with higher levels of support or higher-quality friendships appeared to be protected from some of the negative outcomes of stress. In particular, the relationships between both types of stress and anxiety were moderated by social support and friendship satisfaction. However, for academic stress, the buffering effect of friendship satisfaction was only marginally significant at the .06 level. For depression, friendship satisfaction buffered overall stress but did not buffer academic stress. Social support did not buffer either type of stress. Finally, counter to our predictions, the buffering effects of social support and friendship satisfaction on physical symptoms did not emerge–perhaps because, as a group, college students are relatively healthy. Social relationships may play an increasingly important role as physical symptoms become more frequent and severe with age.

This study had several limitations. First, the study design was cross-sectional, and thus we are unable to identify causal processes or directions. It may be the case, for example, that the social styles of individuals with poorer mental and physical health, compared to those of healthier individuals, tend to result in less satisfying friendships and less social support from the people in their lives. Furthermore, this study was based on self-report measures, which are always subject to bias (Dunning, Heath, & Suls, 2005). However, self-reports have been shown to predict future health status even after adjusting for objective health indicators (Idler & Benyamini, 1997). Finally, due to time constraints, we were able to use only brief measures of social support and friendship satisfaction and thus could not examine specific subtypes of these constructs.

Several methodological strengths of this study deserve mention. Most importantly, this study examined individuals' perceptions of both social support and friendship satisfaction, allowing us to compare directly the relative impact of these two key aspects of social relationships on health and well-being. Regarding the sample, the entire undergraduate student body of a public university was invited to participate in this survey. Although the overall response rate was low (11%), as previously mentioned, the demographic characteristics of the resultant sample were similar to those of the student body as a whole, with the exceptions that the sample was younger (mean age 20 years for the sample vs 22 years for the whole population) and had more female respondents than the overall student population (65% vs 54%). Because of these differences, age and sex were treated as control variables in the study.

In conclusion, college students' well-being benefits from supportive, high-quality relationships with others. The findings of the present study underscore the importance of both social support and friendship satisfaction as distinct constructs that make independent and differential contributions to health and well-being. A better understanding of the underlying processes that lead to friendship satisfaction among college students might help explain these findings. To what extent does friendship satisfaction arise from joint participation in pleasurable leisure activities; feelings of comfort, companionship, and belongingness; a high ratio of positive to negative social interactions; validation of self by the "other"; or provision of a sense of identity, to name just a few possibilities? And to what extent do these and other components of friendship satisfaction contribute independently to students' health and psychological well-being? Use of a more comprehensive measure of friendship satisfaction would help to delineate the underlying processes involved.

Research on friendship satisfaction also may yield useful practical implications. Unlike social support, which is typically provided by a small and intimate group of persons, friendship satisfaction can be provided by persons in one's larger social network. College personnel who have responsibility for students' well-being can increase students' opportunities to develop satisfying friendships by enhancing the availability of a diversity of campus interest groups and encouraging students to join them. Counseling facilities could offer dormitory-based programs that emphasize the importance of friendships for health and well-being and provide help to students in honing their friendship-related skills. These strategies may be more feasible and beneficial than trying to increase levels of social support among students who vary widely in their backgrounds, resources, and personal proclivities.

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Appendix A

Survey Measures

Perceived Stress Scale

In the last 4 weeks, how often have you felt…	Never	Almost Never	Sometimes	Fairly Often	Very Often
That you were unable to control the important things in your life?					
Confident about your ability to handle your personal problems?					
That things were going your way?					
Difficulties were piling up so high that you could not overcome them?					

Academic Concerns Scale

Please indicate how much you agree with each of the following.	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I feel satisfied with how well I am doing academically.					
I worry that my grades will not be as good as I need them to be.					
I feel as though I will not be as successful academically as I should be.					
I believe I will do well enough academically to achieve my goals.					

Multidimensional Scale of Perceived Social Support

Please tell us how strongly you agree with each of these statements.	Very Strongly Disagree	Strongly Disagree	Disagree Somewhat	Neither Agree nor Disagree	Agree Somewhat	Strongly Agree	Very Strongly Agree
There is a special person with whom I can share my joys and sorrows.							
My family really tries to help me.							
I get the emotional help and support I need from my family.							
I have a special person who is a real source of comfort to me.							
I can count on my friends when things go wrong.							
I have friends with whom I can share my joys and sorrows.							
There is a special person in my life who cares about my feelings.							
My family is willing to help me make decisions.							
I can talk about my problems with my friends.							

Social Concerns Scale

Please indicate how much you agree with each of the following.	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I feel satisfied with the quality of my social life.					
I have friends that care about me and that I enjoy being with.					
I have trouble getting along with my close friends and acquaintances.					
I feel lonely.					

Center for Epidemiological Studies Depression Scale

During the past week…	Rarely/ None of the time/ 1 day	Some/ A little of the time/ 1-2 days	Occasionally/ A moderate amount of the time/ 3-4 days	Most/ All of the time/ 5-7 days
I did not feel like eating; my appetite was poor.				
I had trouble keeping my mind on what I was doing.				
I felt depressed.				
I felt that everything I did was an effort.				
My sleep was restless.				
I felt sad.				
I could not get "going."				

Hospital Anxiety and Depression Scale: Anxiety Subscale

During the past week…	Rarely/ None of the time/ 1 day	Some/ A little of the time/ 1-2 days	Occasionally/ A moderate amount of the time/ 3-4 days	Most/ All of the time/ 5-7 days
I feel tense or 'wound up'.				
I get a sort of frightened feeling as if something awful is about to happen.				
Worrying thoughts go through my head.				
I can sit at ease and feel relaxed.				
I get a sort of frightened feeling like 'butterflies' in the stomach.				
I feel restless as if I have to be on the move.				
I get sudden feelings of panic.				

Child Health and Illness Profile- Adolescent Edition Physical Discomfort Scale

In the past 4 weeks, on how many days…	No days	1 to 3 days	4-6 days	7-14 days	15-28 days
Did you feel really sick?	1	2	3	4	5
Did you wake up feeling tired?	1	2	3	4	5
Did you tire easily or feel like you had no energy?	1	2	3	4	5
Did you have aches, pains, or soreness in your muscles or joints?	1	2	3	4	5
Did you have pain that really bothered you?	1	2	3	4	5
Were you free of pain?	1	2	3	4	5
Did you feel really	1	2	3	4	5

healthy?

Did you have trouble eating or have a poor appetite?	1	2	3	4	5