

2011

# Stress and Support during the First Year Experience

Courtney E. Ignarri  
*Lehigh University*

Follow this and additional works at: <http://preserve.lehigh.edu/etd>

---

## Recommended Citation

Ignarri, Courtney E., "Stress and Support during the First Year Experience" (2011). *Theses and Dissertations*. Paper 1329.

This Dissertation is brought to you for free and open access by Lehigh Preserve. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of Lehigh Preserve. For more information, please contact [preserve@lehigh.edu](mailto:preserve@lehigh.edu).

# Stress and Support during the First Year Experience

by

Courtney Ignarri

A Dissertation

Presented to the Graduate Committee

of Lehigh University

in Candidacy for the Degree of

Doctor of Philosophy

in

Psychology

Lehigh University

May 23, 2011

Copyright  
Courtney Ignarri

Approved and recommended for acceptance as a dissertation in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

Courtney Ignarri

Stress and Support during the First Year Experience

---

Date

---

Dr. Christopher Burke

---

Accepted Date

**Committee Members**

---

**Dr. Diane Hyland**

---

**Dr. Dominic Packer**

---

**Dr. Judith Lasker**

## Acknowledgements

To my advisor, Christopher Burke, I cannot express how grateful I am for all of your guidance and support throughout this dissertation study. You have been a wonderful advisor and mentor, and I have learned so much from you over the course of the last few years. I would also like to thank my committee, Diane Hyland, Dominic Packer, and Judith Lasker, for their thoughtful and insightful feedback. I know that the project has only been enriched by their influence. Sincerest thanks to the Office of the First Year Experience for their enthusiasm and cooperation in the completion of the current study. Special thanks to Mariko Sasaki, who single-handedly saved a draft of this work from the tech ether along with the author's sanity. I must also thank *my* social support network, my fellow graduate students. I would not have made it through this program, let alone this project, without your encouragement and support. In particular, I am indebted to Tia Panfile and Aline Sa, two amazing friends and even better cheerleaders, as well as Jessica Goren, an incredible lab-mate. I must also thank my parents who have always believed in me and without whom this achievement would not have been possible. Finally, to my brother Michael, for his unending support, all I have to say is...cheers, cheers, cheers!

## Table of Contents

List of Tables .....	vii
List of Figures .....	viii
Abstract.....	1
Introduction .....	2
Perceived Support .....	2
The Buffering Hypothesis.....	6
Evidence for Stress Buffering .....	9
The First Year Experience .....	17
Current Study.....	21
Methods.....	24
Design and Participants .....	24
Procedure.....	26
Measures .....	27
Demographic Information .....	27
Stress .....	27
Perceived Support.....	27
Appraisal.....	29
Adjustment Outcome Variables .....	30
Results.....	32
Characteristics of the Sample.....	32
Analytic Approach.....	33
Normative Change over Time .....	35
Stress .....	35
Perceived Support.....	35
Appraisal.....	37
Depressive Symptoms and Self-Esteem.....	37
Variability .....	37
Summary.....	38
Support: Home vs. College .....	39

Variability .....	42
Summary.....	43
The Stress Buffering Hypothesis.....	44
Depressive Symptoms and Self-Esteem .....	46
Subjective Adjustment Outcomes .....	50
Session as a Proxy of Stress.....	51
Stress Buffering via Appraisal .....	51
Challenge Appraisal.....	53
Confidence Appraisal.....	55
Appraisal and Perceived Support.....	57
Summary.....	57
Discussion .....	59
Normative and Person-Specific Change during the First Year of College .....	59
Stress Buffering (via Appraisal) .....	62
Possible Mechanisms of Perceived Support.....	66
Limitations .....	69
Conclusion.....	74
References .....	75
Appendix A .....	103
Appendix B .....	104
Vita .....	115

## List of Tables

Table 1	Demographic Information Collected at Time 1.....	83
Table 2	Reliabilities (Raw Alphas) for All Measures.....	84
Table 3	Variability for Normative Change Analysis .....	85
Table 4	Variability for Support Provision and Relationship Quality of Support Networks .....	86
Table 5	Model I: Stress Buffering via Challenge Appraisal: for the CES-D.....	87
Table 6	Model II: Stress Buffering via Challenge Appraisal: for the CES-D .....	88
Table 7	Model I: Stress Buffering via Challenge Appraisal: for the RSE.....	89
Table 8	Model II: Stress Buffering via Challenge Appraisal: for the RSE .....	90
Table 9	Model I: Stress Buffering via Confidence Appraisal: for the CES-D.....	91
Table 10	Model II: Stress Buffering via Confidence Appraisal: for the CES-D.....	92
Table 11	Model I: Stress Buffering via Confidence Appraisal: for the RSE.....	93
Table 12	Model II: Stress Buffering via Confidence Appraisal: for the RSE .....	94

## List of Figures

Figure 1	Perceived Support Moderates the Relationship between Stress and Distress.....	95
Figure 2	Mediated Moderation Model of Stress Buffering .....	95
Figure 3	Change over Time: PSS.....	96
Figure 4	Change over Time: SPS.....	96
Figure 5	Change over Time: ISEL .....	97
Figure 6	Change over Time ISEL Overall.....	97
Figure 7	Change over Time: Challenge Appraisal .....	98
Figure 8	Change over Time: Confidence Appraisal .....	98
Figure 9	Change over Time: CES-D.....	99
Figure 10	Change over Time: RSE.....	99
Figure 11	Time Spent with Close Other by Network.....	100
Figure 12	Communication with Close Other by Network.....	100
Figure 13	Positivity of Interactions with Close Other by Network.....	101
Figure 14	Social Support: Home vs. College .....	101
Figure 15	Between-person Interaction of Stress and Support .....	102

## Abstract

Stress is an inevitable part of daily life that has a variety of negative physiological and psychological consequences for individuals. Social support is thought to ameliorate these effects. Specifically, perceived support has been predicted to buffer or reduce the negative impact of stress. This Buffering Hypothesis (Cobb, 1976; Cohen & Wills, 1985) has been examined a great deal since its initial proposal over thirty years ago, but few studies incorporate key mechanisms of the model, such as appraisal, and many use only cross-sectional or correlational designs which lack the ability to analyze within- and between-person effects. The current study attempted to provide a thorough examination of stress buffering through a longitudinal study of stress, perceived support, appraisal, and distress across four time-points. The study examined a major stressful event, the transition from high school to college, as it was occurring. Typically a stress-by-support interaction is the primary criterion for identifying a stress buffering effect (Cohen & Wills, 1985), but the current study also applied a mediated moderation model based on a novel interpretation of the literature. The Buffering Hypothesis was examined using both criteria as well as in models that combined and separated the within- and between-person effects. Much of the work in the current literature does not allow for the separation of these types of effects so combined analyses are meant to mimic such findings. The longitudinal design also enabled me to use a mixed model approach that separated the between- and within-person stress buffering processes. Overall, there was both stability and variability in stress, appraisal, and social support over the course of the first semester, with students relying heavily on both Home and College support networks. Stress buffering, as defined by the more standard interaction criterion, was supported under certain conditions, but was unsupported under the novel mediated moderation criterion. This suggests that appraisal may not be the mechanism by which perceived support operates to buffer one from stress. Implications for the Buffering Hypothesis and future research are discussed.

## **Stress and Support during the First Year Experience**

Daily hassles and major stressful events are unavoidable parts of life and people have developed a myriad of strategies through which to endure, ignore, or resolve these stressful experiences. Although many of these are solitary forms of coping, an important tool in dealing with stress is, in fact, other people. Social support is understood as either physical or emotional comfort provided by a close other (e.g., friend, family member, co-worker, etc.) during times of stress (Feldman & Cohen, 2000). Perhaps surprisingly, one of the most beneficial and influential types of support is perceived support, which is one's cognitive assessment of the availability of help and connection to others (Barrera, 1986). What is fascinating is that just the perception or belief that support would be available is associated with countless positive outcomes such as a reduction in stress and distress (Barrera, 1986), lower mortality rates, and better health outcomes (Uchino, 2009).

The positive outcomes associated with perceived support have been documented in decades of empirical work; however, the mechanisms by which this process operates have been given much less attention and remain largely untested. To investigate these processes, I focus on a specific population enduring a unique stressful experience: students transitioning from high school to college. Using this naturally existing stressful situation allowed me to investigate the proposed relationships between stress and social support constructs in a meaningful real-world context. The findings have serious implications for the theoretical understanding of perceived support and how it operates as well as for future research in this domain.

### **Perceived Support**

Beliefs about others' availability and willingness to help in times of need are associated with a wide range of benefits in relation to the adjustment to stress. Having a high

sense of perceived support is associated with lower levels of both stress and distress (Barrera, 1981) and improved psychological well-being (Cohen & Wills, 1985). With regard to personality and social relationships, it is negatively associated with hostility and social conflict (Gallo & Smith, 1999) and positively associated with social competence (Sarason, Sarason, Hacker, & Basham, 1985). Perceived support has even been linked with the improvement of physical ailments and depressive symptoms (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) and lower mortality risk from coronary heart disease above and beyond the effects of more typical physiological predictors (e.g. weight, hypertension, diabetes, and physical inactivity; Orth-Gomer, Rosengran, & Wilhelmsen, 1993). Research has also demonstrated that perceived support is related to immune system function and decreased susceptibility to illness (Cohen, Doyle, Skoner, Rabin, & Gwaltney, 1997; Cohen, Doyle, Turner, Alper, & Skoner, 2003), a reduction in complications associated with pregnancy and labor (Kennell, Klaus, McGrath, Robertson, & Hinkley, 1991), and faster recovery from medical treatment (Kulik & Mahler, 1989).

In relation to the population of interest in the current study, perceived support has also been highlighted as a key element in the ability to cope with the college transition. Better adjustment to college has been linked with high perceived social support (Cutrona, Cole, Colangelo, Assouline, & Russell, 1994), and perceived support has been cited as one of the most critical protective factors for college students (Tao, Dong, Pratt, Hunsberger, & Pancer, 2000). Consistent with this notion, perceptions of support in the first year have been shown to predict social and emotional adjustment to college (Friedlander, Reid, Shupak, & Cribbie, 2007). In a longitudinal design with two data points (Fall and Spring), Friedlander et al., (2007) showed that greater perceived support from friends (relative to family) predicted improved adjustment. It is apparent that perceived support, a well-established correlate of

health and well-being, is also an important associate of student success, whether it be academic, social, or emotional.

Perceptions of support are associated with a wide array of positive outcomes, but there is little concrete understanding of why this is so. Initially, it was assumed that actual instances of support (i.e., enacted or received support) explained the negative relationship between perceived support and distress. In other words, receiving support was thought to influence both support perceptions as well as levels of distress and well-being. Even though it makes sense that perceptions of support would stem from supportive acts, empirical evidence fails to support the idea that the two concepts are strongly related to one another or even to similar outcomes.

Studies have found them to be only weakly associated (Lakey & Drew, 1997) with some finding correlations of only .01 between the two concepts (Sandler & Barrera, 1984). In a review of the literature Barrera (1986) concluded that measures of social support were weakly related and relatively independent from one another citing that they are typically correlated at below the  $r=.30$  level. Not only are these concepts weakly associated, but empirical work has also illustrated that enacted support cannot explain the negative relationship between perceived support and distress (Kaul & Lakey, 2003; Wethington & Kessler, 1986). Thus, enacted support is not the primary basis for perceptions of support, and does not explain why mere beliefs have such a strong association with adjustment. If enacted support is ruled out as a primary mechanism of perceived support, then one or more other mechanisms must be involved in this process.

Given that perceptions of support are associated with improvements in both physiological and psychological health, outside of the influence of actual support behaviors, it is tempting to assume that perceived support is responsible for all of these positive

outcomes, but there is minimal evidence to date supporting the existence of causal relationships among perceived support, stress, and distress. Feldman, Downey, and Schaffer-Neitz (1999) used lagged variables to examine the directionality of these associations, and found that, for those experiencing chronic pain, perceived support on one day was associated with less pain and a decrease in negative mood on the following day while the reverse was not true. Although changes in perceived support were found to precede changes in pain and mood, the correlational nature of this study limits the causal conclusions that can be drawn from it.

Establishing causality with regard to stress and perceived support is challenging because these variables lend themselves better to measurement than to manipulation. Interest in them tends to lie in their applied, real world implications. Thus even where it is possible to manipulate these variables in labs, the reduction in ecological validity may be problematic for researchers interested in understanding and alleviating specific distress through the creation of therapies, interventions, or guidelines for caregivers.

Often when stress is manipulated methodology leaves serious questions about how meaningful these experiences are and how well they will map onto the way in which people process and respond to everyday stress. For instance, Bolger and Amarel (2007) manipulated stress by informing participants that they would have to give an impromptu video-recorded speech. While writing the speech a confederate posing as another participant offered support in the form of advice on essay writing. It is unclear whether or not participant experiences of “stress” and “support” in this study reflect what their processing of stress and support would look like outside of the controlled lab setting. Stress is often intense and enduring, and is stressful mainly because it is related to events, people, or goals that are highly important to individuals. Thus, it is questionable whether or not performance on “stressful”

tasks in the lab truly approximates the kinds of stressors experienced in daily life.

Perceived support is rarely manipulated, mainly because of the general assumption that it is a fixed characteristic unlikely to be altered by context or time (Pierce, Sarason, & Sarason, 1996; Lakey, Tardiff, & Drew, 1994). This assumption may also explain why many social support studies are cross-sectional and not longitudinal. If a construct is not expected to vary greatly then it is unnecessary to track it over time. There have been some attempts to alter perceptions of support in intervention studies focused on improving health outcomes, but these have mostly been unsuccessful (Cohen & Janicki-Deverts, 2009). Lab-based manipulations of stress are much more frequent and successful relative to those for perceived support, but again may not be optimal. Although controlled experiments are paramount to the growth and progress of any scientific area, the conditions created in the lab may not reflect how people think, feel, and act in naturalistic settings.

Perceived support is undoubtedly an important factor in the experience and management of stress and distress that operates outside of the influence of supportive behaviors, but because specifying what it does and how it works has been so difficult, these aims have been mostly abandoned. Studies continue to demonstrate that perceived support is associated with more and more constructs (e.g., health-related quality of life, Zhou et al., 2010; self-confidence, Freeman & Rees, 2010; life satisfaction, Malinauskas, 2010), but to my knowledge none even attempt to specify that perceived support is responsible for these outcomes and, if so, how this is actually happening.

### **The Buffering Hypothesis**

The prevailing hypothesis about how perceived support might be operating to yield positive outcomes is the Buffering Hypothesis (Cohen & Wills, 1985; Cobb, 1976). Support is thought to shield or buffer individuals from the full impact of stressors, particularly when

individuals are actually undergoing higher degrees of stress (Cohen & Wills, 1985). Again, research has demonstrated that actual transactions of assistance cannot explain the negative relationship between perceived support and distress (Kaul & Lakey, 2003, Wethington & Kessler, 1986). Cohen and Wills (1985) proposed that perceived support reduces the impact of stress in two ways: by altering the appraisal of a stressor as threatening or by reducing the stress reaction through a direct impact on physiological processes (Cohen & Wills, 1985). Cohen and colleagues have pursued a line of work that focuses on this second more direct physiological path (Cohen, 2004). This work has resulted in impressive evidence showing that perceived support is related to the body's response to stress, although uncertainty remains about how these processes work (Cohen & Janicki-Deverts, 2009). Consistent with the first more cognitive path highlighted by Cohen and Wills (1985), in his Stress Prevention Model, Barrera (1986) proposed that perceived support might prevent stressors from being realized or decrease the perception of events as stressful.

Lazarus and Folkman's (1984) Transactional Model of Stress and Coping expanded on the idea of appraisal as a mechanism involved in stress and coping processes. They defined cognitive appraisal as the determination that a specific event in the environment has significance for one's well-being and specified two distinct appraisal processes. Primary appraisal occurs when an individual determines the nature of the encounter (i.e., is it irrelevant, positive, threatening, or challenging?); the implications are that if events are evaluated as being irrelevant or positive no further action is needed, but if they are threatening or challenging, mental, physical, and social resources may need to be assessed and recruited for future use to respond and deal with the stressor. Secondary appraisal is the evaluation of possible responses to the encounter (i.e., can it be prevented, dealt with, or resolved?) and refers to the content and quality of the resources mentioned above. Although

Lazarus and Folkman (1984) do not include perceived support in their theoretical conception of the appraisal process, their work has frequently been adapted by social support researchers and applied to the models suggested by Cohen and Wills (1985) and Barrera (1986).

So far appraisal concepts seem as if they apply mainly to external events, but Thoits (1986) adds that one's reactions to stressors can be threatening in and of themselves. She emphasizes the negative implications of despair and anxiety (among other negative reactions that might stem from a stressful experience) and how they can influence one's sense of self-control, ability to cope, and capacity to draw on social resources. Thus, perceived support may "buffer" one from the full impact of a stressor by altering the situation or subsequent emotional responses (Thoits, 1986).

Multiple sources have proposed that perceived support alters perceptions to make stressors seem less stressful. Rodriguez and Cohen (1998) suggest two possible ways in which this might occur. The event itself could be perceived as less threatening or harmful (e.g., "The test won't be as bad as I think it will be."). Alternately, one's ability to cope with the stressor could be perceived as sufficient or effective (e.g., "I have plenty of time to study and I know the material well."). These paths can also be interpreted in terms of the Lazarus and Folkman (1984) appraisal framework. Perceptions of support might influence the processing of a stressor as threatening (primary appraisal) and/or cognitions about what can be done to resolve the situation (secondary appraisal).

To illustrate these relationships, consider two incoming freshmen both overwhelmed at the prospect of beginning college. Each student might wonder how they will handle moving into a new place, making new friends, and performing well in classes. One perceives that her parents are ready and willing to help in any way if they are needed and also feels she

has a plethora of other family and old friends to rely on during this stressful period. The other believes that her parents will be largely absent or unhelpful and does not believe that there are any other resources to turn to for help. Both share the same concerns and worries yet neither has any concrete evidence to suggest how close others in their lives will react to their current situation. Their expectancies, not their actual experience of support, change their psychological interpretation of the stressor.

The student who perceives high levels of support to be available should appraise this transitional period as less stressful and should exhibit less anxiety and distress. The student who perceives low levels of support to be available should appraise the situation as highly threatening and may experience anxiety and depressive symptoms. One's perceptions of support may actually alter both the nature and the impact of the stressor, which in turn should influence mood, depressive symptoms, self-esteem, self-efficacy, and any of a whole host of psychological and physiological factors. To reiterate, higher levels of perceived support are believed to shield or buffer individuals from the full impact of stressors by altering their appraisal of the stressor itself or of their own coping resources.

### **Evidence for Stress Buffering**

An ideal examination of the stress buffering effect in a naturalistic setting would be a longitudinal study with more than two time points. The inclusion of several time-points would allow for patterns of change to be detected such that one can know if participant responses represent a stable state or are more a reflection of current events. For example, a participant might indicate a high level of stress at a particular time-point because they generally experience greater stress than others or because they failed a test the previous day which is elevating their level of stress at the assessment. If stress was measured only once or twice it would be impossible to distinguish between these two possibilities. The ideal study

would also take place during or immediately surrounding the stressful experience of interest so that participant responses can best reflect participants' true thoughts and feelings regarding the situation. Importantly, all of the relevant variables should be included in the study and in the analyses of stress buffering (e.g., stress, perceived support, appraisal, and distress/well-being). To date, very few studies of stress buffering process have met this ideal standard.

My interpretation of the stress buffering model, in light of the contributions of both Cohen and Wills (1985) and Lazarus and Folkman (1984,) is represented by a mediated moderation of perceived support and appraisal on the stress/distress relationship. Perceived support is expected to moderate the relationship between stress and distress such that higher levels of perceived support weaken the association between stress and distress, while lower levels of support strengthen this relationship (See Figure 1). Appraisal should mediate the association between perceived support and the stress/distress relationship. Thus, perceived support is thought to moderate the link between stress and distress both directly and indirectly, by altering appraisals. Taken together, this means that the moderation of perceived support on stress/distress is mediated by appraisals (See Figure 2). Although I believe that this statistical model is the best representation of stress buffering via appraisal, much of the work in this area utilizes a simpler set of criteria to establish stress buffering.

Cohen and Wills (1985) suggested a less rigorous statistical standard that needed to be met to demonstrate that “buffering” was being observed. They asserted that studies should show significant main effects for stress and support as well as a significant interaction of stress and support in relation to relevant distress outcomes. Consequently, stress buffering is typically equated with an interaction of stress and support. In an analysis of over forty studies, Cohen and Wills (1985) found evidence of buffering congruent with the above

conditions, but only for perceived support (relative to measures of social integration). Cohen and Wills (1985) is a highly influential paper, cited over 2,300 times according to PsycINFO (retrieved 04/01/2011), and the interaction criterion has been adopted by researchers in hundreds of studies on stress buffering.

In a longitudinal assessment of female students at two time points six months apart, Power (1988) examined stress buffering using the criteria identified by Cohen and Wills (1985). The Significant Others Scale (SOS; Power, Champion, & Aris, 1988) measured emotional and practical forms of perceived support and the Life Events Inventory (LEI; Cochrane & Robertson, 1973) measured stress. Power (1988) conducted hierarchical multiple regressions that showed that both Time 1 emotional support and Time 2 stress independently predicted depressive symptoms at Time 2. In addition, a stress-by-support interaction was observed, as indicated by the significant interaction of stress and emotional support. However, the interaction of stress and support was not significant for practical support. Although stress buffering was found in this study, it does not represent a thorough examination of the Buffering Hypothesis. Absent from both Cohen and Wills (1985) and Power (1988) is the inclusion of appraisal, or any variable for that matter, as a mediator in the stress buffering model.

Research has demonstrated that appraisal plays an important role in the experience of both perceived support and distress. McNett (1987) investigated the relationship between perceived support and appraisal. She measured perceived support, coping responses, coping effectiveness, support effectiveness, and threat in wheelchair bound participants. Of note, McNett (1987) found that higher levels of perceived support were related to lower levels of threat appraisal. Further work has highlighted the importance of appraisal for adaptational outcomes (Hudek-Knezevic & Kardum, 2000).

Hudek-Knezevic and Kardum (2000) measured the coping styles and strategies of adult females in response to four hypothetical stressful situations that were meant to reflect typical conflict situations, in addition to assessing perceived social support, primary appraisal (threat), and secondary appraisal (controllability). Immediate outcomes were appraisal of satisfaction with coping and efficacy of coping. Using linear structural equation modeling, threat appraisals were associated with decreases in satisfaction and efficacy of coping while controllability appraisal was related to increases in these same outcomes. Perceived support was associated with decreased threat appraisals and increased controllability appraisals. Meanwhile, threat appraisal had a greater association with coping efforts relative to controllability. The use of hypothetical situations as stress may not accurately reflect the real-world on-line experience of support, appraisal, and distress, but this study did provide some evidence suggesting that appraisal is associated with perceptions of support and stress management (i.e., coping).

Although both primary and secondary appraisals have been shown to relate to perceptions of support, much of the previous work fails to examine these variables in the context of a full stress buffering model, whether that be the mediated moderation I envision or some other amalgamation of these concepts. However, there are several studies that do take this additional step to test role of appraisal more broadly.

The moderating role of controllability appraisal was examined in relation to coping and coping effectiveness. In a two-year longitudinal study of college students, Valentiner, Holahan, and Moos (1994) measured parental support, approach coping (e.g., positive reframing and problem solving), event controllability, and psychological adjustment (e.g., wellbeing, happiness, self-worth, and depressive symptoms) over two time-points at the beginning and end of the study. Participants were asked to choose the most challenging

stressful event they had experienced in the last 12 months and to respond to all items in reference to this event. Structural equation analyses showed that parental support was both directly and indirectly linked to adjustment depending on event controllability (i.e., controllability appraisal). When events were controllable, parental support was associated with adaptive coping (greater use of approach coping strategies), which in turn predicted adjustment, but when events were uncontrollable this association disappeared and family support context was directly related to adjustment.

One problematic feature of the study is that each participant chose their own stressful experience to reflect on. Poor or distorted memory is a concern, but more importantly it is difficult to ensure that participant experiences are comparable. For instance, one person may be thinking about the death of a parent while another thinks about a difficult final exam. Additionally, the study design presumes that approach coping strategies (positive reframing and problem solving) and parental support would be preferable to all participants in all situations. The study suggests that appraisal is a viable mediator, but does not present a full model within which to assess the buffering hypothesis. Again, such a model should include measures of stress, perceived support, appraisal, and distress, and ideally should allow the participant to more flexibly identify aspects of each as opposed to being forced to evaluate only one form of support and one form of coping pre-selected by researchers.

These concepts have been tested experimentally, although not in direct reference to the Buffering Hypothesis. Gidron & Nyklicek (2009) manipulated event severity, appraisal, coping, and social support in 16 stress scenarios (e.g., “Recently, you don’t have anyone to talk to. You are drinking coffee in town, and it suddenly spills on your pants. You think it is terrible but try to forget about it and continue reading a magazine.”). In a mixed-design

analysis of covariance, they found significant main effects of event severity, appraisal, and support on estimated distress. Appraisal did not mediate the event-distress relationship; however, in line with stress buffering, appraisal interacted with event severity wherein appraisals influenced estimated distress but only when events were severe. Stress-by-support interactions were not examined, but this study did allow for a causal examination of the relationships between stress, support, appraisal, and distress. The use of hypothetical situations in which all factors are manipulated, especially appraisal, support, and distress (which are highly subjective), is not likely to be analogous to real world stressful experiences or the actual processing of support information. The authors acknowledge these limitations and encourage future research in naturalistic settings.

Elliott, Herrick, and Witty (1992) examined the association between these constructs with two different groups of individuals: college students and the physically disabled. Participants completed self-report measures of problem solving ability, perceived support, and depressive symptoms. The authors proposed that appraisal of problem-solving ability would moderate the association between support and distress. Elliott, Herrick, and Witty (1992) employed hierarchical multiple regression and found that regardless of sample, appraisal and support independently predicted depressive symptoms, but did not interact significantly.

In a cross-sectional study of men with HIV/AIDS, Pakenham and Rinaldis (2001) assessed illness, coping resources (social support, optimism), coping strategies, and cognitive appraisal (threat, challenge, and controllability). Adjustment variables included depressive symptoms, global distress, subjective health status, and social adjustment. Pakenham and Rinaldis (2001) found appraisal, regardless of type, to be an important predictor. Threat appraisal was a significant positive predictor of all adjustment dimensions, and controllability

appraisal was positively linked with improved health. Challenge appraisal was negatively related to global distress but positively related to social adjustment. Despite significant linkages between appraisal and outcome measures, the predicted interaction between threat and support was non-significant for all of the dependent variables. The mediated moderation model being examined in the current study does not make any predictions about the interaction of support and appraisal.

Neither of the real world studies mentioned above found evidence for the buffering hypothesis. However, both Elliott, Herrick, and Witty (1992) and Pakenham and Rinaldis (2001) used cross-sectional designs. A more thorough test of the buffering hypothesis would be a longitudinal design of three or more time-points because it would provide greater detail about changes in these variables over time, both normatively and within individuals. Longitudinal designs with only two time-points prove inadequate for effectively studying individual growth (Bryk & Weisberg, 1977; Rogosa, Brand, & Zimowski, 1982; Bryk & Raudenbush, 1987); thus designs that include several assessment points are ideal. Additionally, the full mediated-moderation of perceived support and appraisal on the stress distress relationship should be examined.

The Buffering Hypothesis was introduced over thirty-five years ago (Cobb, 1976), and has been well accepted in the social support literature, yet evidence substantiating buffering relationships is scarce. Two major gaps are apparent. First, although higher levels of perceived support have been associated with a weaker relationship between stress and distress (Cohen & Hoberman, 1983; Fleming, Baum, Gisriel, & Gatchel, 1982; Frydman, 1981; Henderson, 1981; Henderson, Byrne, Duncan-Jones, Scott, & Adcock, 1980; Miller & Ingham, 1979; Paykel, Emms, Fletcher, & Rassaby, 1980; Wilcox, 1981) research has failed to address the causal relationships among stress, perceived support and distress in ways that

have meaningful implications for how people actually experience and manage real world stressors. While the ability to determine the causal connections between these variables is a critical task for researchers in the support field, it will not be possible in the present study. The desire to study and potentially contribute to knowledge about a naturally-occurring stressor precluded the design of an in-lab experiment that could address this fissure in the literature.

Second, no adequate attempt has been made to demonstrate that appraisal is the mechanism by which perceived support buffers individuals from the full impact of stressors. Several studies have examined appraisal in general, but few have tested its proposed role as a mediator and none have done so in a manner that has sufficiently tested the mediated moderation implied by the Buffering Hypothesis. Again, an ideal inquiry would involve the manipulation of all relevant variables, but given the difficulty in doing so naturalistically and the importance of focusing on an applied setting this was not possible. The most thorough examination of the hypothesis, outside of an experimental design, entails a longitudinal study of a naturalistic stressor that is ongoing wherein the full stress buffering model is examined (i.e., stress, perceived support, appraisal, and distress are all measured and included in a mediated moderation model).

The theoretical and applied possibilities inherent in this work are often conflicting. Contributing to theoretical knowledge in a meaningful way often involves sacrificing ecological validity, and conversely studying these processes in ways that can improve therapies, interventions, caregiver experiences, and individual adjustment often prevents causal conclusions from being made. Despite a great desire to further theoretical knowledge regarding causality, understanding how people experience and overcome real life challenges is also a worthy aim. In an effort to satisfy both the theoretical and applied needs in the field

I have chosen to study stress buffering in a naturalistic setting that creates stress for thousands of people each and every year: students entering their first semester of college.

### **The First Year Experience**

The transitional period from high school to college is ideal for the study of stress, support, and the stress buffering hypothesis. Freshmen entering their first semester of college are enduring change in almost every aspect of life. Their living environment, what is expected of them academically, and social relationships, among many other factors, are all in flux. In a qualitative examination of the first year experience, Alipuria (2007) conducted interviews with first year students during the first part of the spring quarter. Students reported experiencing stress, believed that their level of stress was severe but normal among others undergoing the same transition, and tended to bypass campus resources in favor of more personal forms of coping. Alipuria (2007) identified several aspects of the transitional period that were commonly reported by students as being stressful: learning and meeting new and different academic expectations, dealing with changes to their existing relationships with parents and high school peers, balancing academic and social needs, having to be more independent, and experiencing difficulty forming new relationships that were meaningful and intimate.

Only 36% of students who began a bachelor's degree program in 2001 and 2002 finished that degree in four years, 52% in 5 years, and 57% in 6 years (U.S. Department of Education, 2010). That means that a little over 40% of students who start college never finish. Understanding the factors associated with student retention, academic success, and emotional well-being are of both fiscal and moral importance when one considers these staggering drop-out rates. Concerns about what causes student attrition to occur and how to prevent it are of central consequence to students, parents, faculty, and staff. While the

academic challenges inherent in the transition from high school to college may be quite stressful, some studies suggest that attrition and adjustment are influenced more by emotional factors than academic ones (Szulecka, Springett, and DePauw, 1987; Brooks & Dubois, 1995).

One major emotional challenge is the change in relationships with both family members and friends. Separation-individuation, or the renegotiation of relationships and roles within the family unit, is ongoing during this time period as the adolescent attempts to establish independence and autonomy while maintaining close familial bonds (Lapsley & Edgerton, 2002). Schwartz & Buboltz (2004) suggested that individuals may need to extend trust to peers while becoming more independent from parents and noted that achieving this balance often involved conflict with parents.

Kenny (1987) framed the transition from home to college as a naturally occurring strange situation (Ainsworth, 1979), given that students are trying to explore and adapt to their new environment. According to Bowlby (1973), attachment involves internal working models that are cognitive representations of social information about the self, others, and relationships. Bowlby (1973, p.202) proposed that confidence in the availability of attachment figures developed throughout infancy, childhood, and adolescence creates expectations that are maintained throughout the lifespan.

Using the Strange Situation, where infants are observed during separation from and reunion with the mother as well as during interactions with a stranger, Ainsworth (1979) identified three distinct attachment styles (Secure, Avoidant, Anxious/Ambivalent). Infants who were designated as being securely attached were more cooperative and less angry, had more responsive mothers, used mothers as a secure base, were more distressed at the mother's departure, and sought proximity and interaction at the mothers return. Avoidant

babies were angrier, had mothers who found close interaction aversive, and showed little distress when mothers left and ignored mothers when they returned. Anxious-ambivalent babies were more anxious and showed intense distress when separated from the mother, but were ambivalent at mothers return both seeking and resisting contact.

Kenny's (1987) assessment of the first year experience is apt, as students navigate the demands of a new environment while still maintaining home as a "secure base" from which to explore their new surroundings. Those with a secure attachment style are expected to respond to the challenges of the transition independently and adjust well, knowing they can still rely on their parents for support and comfort, but feeling confident enough to pursue new experiences and relationships (Kenny, 1987). Although not directly tested, this idea is supported by a number of studies which show that better adjustment and positive outcomes during this transition are associated with secure attachment (e.g., Armsden & Greenberg, 1987). Similar to a secure attachment, high levels of perceived support are expected to facilitate exploration and active engagement in the environment by providing security, self-confidence, and coping skills (Sarason, Pierce, & Sarason, 1990).

The physical separation from parents in combination with a new social environment means that incoming students must balance the obligations and commitments to both old and new social figures. Swenson, Nordstrom, & Hiester (2008) addressed the challenges of balancing old and new social networks by assessing how relationship quality in each network influenced adjustment. They predicted that continuing relationships with high school peers would be beneficial in the beginning of the first year, but that effective integration and adjustment to the new setting requires connection with college peers. They found that high school friendships characterized by frankness and spontaneity were linked with better adjustment; however, relationships of this type that were marked by exclusivity, were

associated with poor academic and social adjustment, as well as weaker institutional attachment.

Similarly, Bean (1985) found that students with greater attachment to an outside significant other had poorer institutional fit because they were less concerned with and put less time and effort into socialization within the university setting. Thus, early on it appears to be helpful to have a stable close other to rely on while navigating the new academic and social environment, but students who cling too much to old relationships to the detriment of forming new ones fail to engage in their environment fully and do not reap the rewards and benefits inherent in those social connections.

Although academic performance is an important measure of success, students identify several other areas of importance. Yazedijan, Toews, Sevin, & Purswell (2008) had students define college success in a qualitative study of stress and coping. Three dimensions became apparent as markers of success in college: good grades (subjectively defined such that for some students an A average is ideal while for others a B average or passing grade is adequate), social connection to others and the university, and independently navigating the college environment. While these definitions only reflect those of a small sample of students at one university, it does give a sense that students define success more broadly than academic performance, and hold their own standards for achievement.

All of the literature above suggests either directly or indirectly that the college transition encompasses three overarching domains of stress and change: academic performance, social relationships, and balancing old and new relationships. The shift from high school to college clearly represents a rich environment in which to study stress and support processes. Students will be experiencing the “same” stressor, but this is a prime environment in which to measure how individuals’ expectancies and support beliefs will alter

their subjective experience of stress and support.

The unique nature of this stressor is particularly advantageous to the study of stress and support. One major problem in the study of stress in real world settings is timing. Often studies ask participants to predict how they will feel once a stressful event occurs or how they felt during a period stress that happened at some point in the last month or even within the last year because predicting the exact timing of stress is generally not possible. Much of the time individuals are unaware that a stressful event will occur (e.g., when your car breaks down unexpectedly) or are unsure of the exact timing of the event (e.g., the specific date of an impending layoff at your job), and so researchers have difficulty planning and executing studies that can pinpoint the exact timing of stress. Using the transition to college as a stressor is advantageous because it has a specific start date as well as several other key benchmark dates where stress can be expected to rise and fall (e.g., mid-term grades due, Thanksgiving break, etc.). This precision allowed for the selection of data collection points that was both meaningful and practical. Given the ethical concerns of manipulating stress, observing students as they make this transition is an ideal candidate for study given the level of predictability in the occurrence and timing of stress.

### **Current Study**

The current study follows incoming students throughout their first semester of college in order to better understand the nature and intensity of this stressor and to provide a unique stressful environment in which to examine the Buffering Hypothesis. The study represents a major contribution to both the social support and first-year experience literatures. It embodies a thorough examination of the mediated moderation model implied in the Buffering Hypothesis in a naturalistic setting. It examines an ongoing real world stressor, and thus was not susceptible to errors or distortions in memory that can plague

retrospective or hypothetical studies. With regard to the first-year experience literature, the longitudinal design allows for assessment before, during, and after the first semester. This is uncommon, as most studies of post-secondary students do not include pre-orientation measures nor do they include multiple measurements within a semester or in some cases even within one year. There are three specific aims of the present study.

First, it is important to measure the changes in stress, support, appraisal, and distress over time. While largely exploratory, this aim is a significant contribution to the field given the current lack of knowledge about the stability of these variables, particularly for a college sample. I am interested in understanding how levels of the above variables map onto specific benchmarks in the semester (e.g., orientation, midterms, etc.). Prior work has not provided a clear understanding of the patterns of change to be expected in each of these variables due to either a lack of longitudinal design or time points that occur too far apart and thus miss a great deal of change likely to occur between assessments. Both stress and distress were expected to increase, particularly from the pre-orientation period to the initial few weeks on campus, as well as during the period between mid-terms and finals, but were expected to level off or decrease by the post-semester assessment. Support levels were expected to remain stable for close others from the home network, while increasing for those in the college network gradually over time. Appraisals were predicted to be highly related to support and thus were anticipated to remain somewhat stable, consistent with the predictions for support. Self-esteem should decrease during particularly stressful periods while depressive symptoms are expected to increase.

A second purpose of the study is to examine how students' social support networks and their use of these networks change in response to the transition from high school to college. Students are expected to quickly develop a new social support network in the college

environment and to come to increasingly rely on this network over time. Reliance on the old or home social support network is expected to decrease over time as students become more independent. This study is also unique in that it provides a firsthand look at the formation of new support networks.

The third and principal aim of the study is to provide a thorough test of the Stress Buffering Hypothesis, which suggests that the way in which perceived support reduces stress is by buffering individuals from the full impact of stressors via appraisal. I expected that both stress and support would be directly linked to psychological adjustment (depressive symptoms, self-esteem, social satisfaction, academic satisfaction), and that stress buffering (as statistically defined by Cohen and Wills, 1985) would be observed as evidenced by an interaction of stress and support for each of the outcome variables. This relationship would indicate that greater perceived support moderates or reduces the impact of stress on distress.

Additionally, perceived support's influence on the stress/distress relationship should be defined by the mediated moderation implied by Cohen and Wills (1985) and Lazarus and Folkman (1984), such that appraisal mediates perceived support's impact on the stress-adjustment relationship. This mediation will be demonstrated by a change in the magnitude of the stress-by-support interaction when the stress-by-appraisal interaction is accounted for. Perceiving greater levels of support is expected to be associated with the framing of the college transition as challenging instead of threatening (primary appraisal) as well as having greater confidence in one's ability to handle beginning one's first semester in college (secondary appraisal). These changes in the appraisal of stress and resources should in turn be associated with levels of distress and well-being.

## Methods

### Design and Participants

This project was conducted in careful coordination with the Lehigh University Office of the First-Year Experience. Their permission to access the incoming class for the 2010-2011 school year and cooperation in recruiting the sample was integral to the success of the study. An initial recruitment e-mail was sent to all incoming students (N=1,212) in early July by the staff of the Office of the First-Year Experience, with a second e-mail being sent several weeks later. Any student who responded to the advertisement was invited to participate in the study, and 93 students expressed interest in participating.

Eighty-one participants completed consent forms and were registered for the study. All 81 completed Time 1 measures (7/27/10 – 8/24/10), 71 completed Time 2 measures (9/7/10 – 10/1/10), 64 completed Time 3 measures (11/1/10 – 11/26/10), and 63 completed Time 4 measures (1/24/11 – 2/11/11) (See Appendix A for more detail on data collection time periods). Two participants were dropped from the analysis because they failed to complete most or all of the questionnaires, leaving a total sample of 79 participants, 62 of which had completed all four sessions (77% of the sample). Additionally, some participants did not provide responses for specific items, questionnaires, or sessions (3% of total responses). Scale scores were not computed when over half of the data for a given scale was missing. Response rates calculated by time-points completed (i.e., percentage of time-points completed by total possible number of participants) was 86% overall, with high response rates by individual time-point as well (T1=100%; T2=88%; T3=79%; T4=78%).

Chi-square analyses were conducted to ensure that there were no systematic differences between those who completed all four time points and those who dropped out of the study. No significant differences were found for age, gender, race, parents'

relationships status, or family composition. Additionally, race and gender were examined as possible covariates, but were not significantly related to any relevant outcome variables.

There were two main effects of gender: Males exhibited higher confidence appraisal scores relative to females, and females had higher ratings of stress relative to males.

The sample consisted of 46 females (58%) and 32 males (41%) ranging from 16-20 years of age. Most respondents identified themselves as being White, came from homes where parents were still married, were the eldest children of the family, and had only one sibling. A minority of participants had some familial or peer connection to Lehigh, and many would be attending with a friend or significant other during the fall semester.

Demographic statistics for the incoming class (Lehigh at a glance, 2010) were examined to determine whether the current sample was representative of the population in question. The sample was fairly representative of the overall Lehigh class of 2014 in terms of basic demographic characteristics. Similar to the study sample, the population gender was almost evenly divided (males 57%; females 43%) although there was a slight majority of females in the study. The racial composition of the study was within 1-3% of the actual composition of the incoming class, with the exception of Asian/Pacific Islander, which was 23% in the current sample but only 6% of the actual population. The current study did not distinguish between ethnicity and non-resident alien status (5% of the Lehigh incoming class) so it is possible that this difference in categorization accounts for some of the larger difference in this specific group. In the General Discussion, I consider other factors that might distinguish this small sample from the larger population.

Prior to attending Lehigh officially students made efforts to contact roommates and integrate themselves into university life mostly through the website Facebook, e-mail, and phone or text. Some even spent time with current or future Lehigh students prior to

attending, visited campus within a month of attending, or planned to participate in pre-orientation activities. Over a third of the sample had had previous college experience through involvement in college or AP courses. See Table 1 for greater detail on responses to all demographic questions.

### **Procedure**

Participants completed four assessments which started just before their arrival at Lehigh and extended into the spring semester. Each session took approximately 30 minutes to complete and was collected online using surveymonkey.com. The timing of each session was carefully selected to represent a significant and meaningful time of stress and change for the participants. Time 1 (7/27/10 – 8/25/10) was a baseline assessment point that took place over the summer prior to participation in the university orientation (8/26/10) as well as before any real or substantial contact with fellow students had occurred. Next, it was important to track student changes shortly after they had arrived on campus and classes began (8/30/10) (after the initial stress of the transition had begun) but prior to becoming fully used to their new environment (Time 2: 9/7/10 – 10/1/10).

Time 3 (11/1/10 – 11/26/10) spanned a period towards the end of the semester, after mid-term exams and prior to final exams (Midterm grades were due 10/20/10, and the last day of classes was 12/10/10). This period was expected to be one of the most stressful times during the semester as academic demands on students were high and the importance of grades and performance was quite salient; also this would be their first finals week and their first set of classes to be completed in college. A final post-semester follow-up occurred in the beginning of the spring semester (classes began 1/17/11) (Time 4: 1/17/10 – 2/11/10) after the stress of the first semester had subsided. Participants were asked to reflect on their first semester in college, with the hope that some distance from the semester

would enable them to evaluate the fall semester experience as a whole.

## **Measures**

**Demographic information.** At Time 1, students were asked a variety of demographic questions, including age, race, family composition (marital status of parents, number and order of siblings), college contact (any interaction with the campus or future students or roommates in person, over e-mail, phone, or Facebook prior to orientation), family history connecting the student with the university (siblings, parents, or other relative who may have attended) and romantic relationship status.

At Time 4, I asked students questions about their general activity level on campus. More specifically they were asked about clubs and activities they were involved with, participation in athletics and Greek life, and drinking habits. Items also assessed their general satisfaction with their social, academic, and emotional experiences at the university over the course of the fall semester. There were also several items asking them to evaluate the long term effectiveness of the orientation experience. See Appendix B for a full set of demographic questions and Table 2 for the reliabilities for all measures across all four time-points.

**Stress.** The Perceived Stress Scale (PSS; Cohen Kamarck, & Mermelstein, 1983) has 10 items rated on a 5-point likert scale ranging from “Never” to “Very Often.” The scale has been shown to have adequate reliability and has been associated with life-event scores and depressive and physical symptomology (Cohen Kamarck, & Mermelstein, 1983). Reliabilities for the scale for all four sessions were high and ranged from .89 to .91. See Appendix B for the full PSS measure and scoring instructions.

**Perceived support.** The Interpersonal Support Evaluation List – College Version (ISEL; Cohen & Hoberman, 1983; Cohen, et al. 1985) contains 3 subscales (Tangible,

Belongingness, Appraisal) with 12 items each to be rated true or false. Subscale scores are created by summing all items on each subscale, and an overall score is produced by summing all items in total. The tangible support subscale assesses the perception of support for actual events or needs (e.g., borrowing money, getting a ride, etc.). The belongingness support subscale examines participant perceptions of their connection and access to their social network. Finally, the appraisal support subscale assesses support for more emotional needs (e.g., ability to discuss dating, medical, social, or other problems). The ISEL also contains a self-esteem subscale, but given the inclusion of a separate self-esteem measure the ISEL self-esteem subscale was omitted.

Cohen and Hoberman (1983) have shown the measure to be reliable and its subscales to have reasonable independence from one another. Additionally, it was moderately correlated with a validated measure of support (the Inventory of Socially Supportive Behaviors) and correlated with social anxiety in two separate samples of college students (Cohen & Hoberman, 1983). The ISEL and its subscales demonstrated moderate to high reliability across the four time points (Overall  $\alpha = .88$  to  $.92$ ; Tangible  $\alpha = .62$  to  $.74$ ; Belongingness  $\alpha = .76$  to  $.83$ ; Appraisal  $\alpha = .80$  to  $.89$ ).

The Social Provisions Scale (SPS; Cutrona & Russell, 1987) is a 24-item measure rated on a 4-point scale ranging from “strongly disagree” to “strongly agree” that examines the degree to which social relationships fulfill various dimensions of support. The total SPS score was calculated by summing across all items. Social provision scores were predictive of loneliness, depressive symptoms, and health (Russell, Altmaier, & Van Velzen, 1984) as well as postpartum depressive symptoms (Cutrona, 1984). It showed convergent validity with life satisfaction, loneliness, depressive symptoms, and satisfaction with social relationships, and measures of social networks (Cutrona, 1984). The SPS was a highly reliable measure at each

of the four collection points ( $\alpha = .91$  to  $.95$ ).

In an effort to simplify later examination of the Buffering Hypothesis, a composite Support variable was created to reflect participant responses on both the ISEL and the SPS. The ISEL and SPS were highly positively correlated ( $r=.72$ ,  $p<.0001$ ) and combining them greatly simplified the analysis of the Buffering Hypothesis by cutting the number of analyses in half. Because the ISEL and SPS used different response scales the composite variable was produced by first calculating z-scores for all ISEL and SPS responses then summing all items together. Reliability for the new Support variable was high across all four time-points ( $\alpha = .94$  to  $.96$ ).

Explicit Ratings of Supportiveness were collected to assess the frequency and quality of contact participants had with specific close others from the home and college environments. I also included items that assessed whether these targets were emotionally, informationally, and instrumentally supportive. See Appendix B for the full set of ISEL, SPS, and close other supportiveness items along with scoring instructions for each.

**Appraisal.** I designed a novel Appraisal Scale specifically for this study that included items for Challenge/Threat and Confidence in support resources. Students were first asked an open-ended question aimed at assessing what aspects of seven stressor categories (Academic, Romantic/Sexual Relationships, Social Relationships (Friends/Groups), Relationship with Parents, Future, Work, and Other) are relevant to them (“What aspects or events related to this category do you anticipate being stressful in the next several months?”). Next they were asked to rate the intensity of stress they experienced regarding these domains on a five-point likert scale ranging from “not at all stressful” to “extremely stressful.”

One set of items measured primary appraisal, which pertains to the nature of an event (i.e., is it irrelevant, positive, threatening, or challenging?). Participants were asked to

choose one of two statements describing each domain that framed the stressor as being threatening vs. challenging (Example: “If I put myself out there, I am not sure anyone would be interested in getting involved with me.” vs. “Even though it seems risky, I know I will never meet my soul mate if I don’t put myself out there.”). Responses for this set of items were summed to create a total Challenge Appraisal score which could range from 0 to 36. Participants could fully or partially endorse either type of framing, and higher scores indicated an overall challenge mindset while lower scores indicate a greater threat mindset. Challenge Appraisal was moderately reliable across all four time-points ( $\alpha = .66-.77$ ).

In order to examine secondary appraisal, which is the evaluation of one’s capacity to deal with a stressor, participants were asked to assess how confident they were that they had the resources to handle each stress domain on a 4-point likert scale ranging from "I am not able to handle the stressor" to "I am completely prepared to handle the stressor." Reliability for confidence items was moderate across the entire study ( $\alpha = .72-.81$ ). See Appendix B for the full set of appraisal items in addition to scoring instructions.

**Adjustment outcome variables.** An important implication of a student’s emotional and social well-being is self-esteem. In an effort to track the impact of stress and support over the semester I included a measure of self-esteem. Rosenberg’s Self-Esteem Scale (1965) contains 10 items that participants are asked to rate on a 4-point likert scale ranging from “strongly agree” to “strongly disagree.” All responses were summed to yield a total RSE score. The scale generally has high reliability with test-retest correlations typically in the range of .82 to .88. Cronbach's alpha for various samples are in the range of .77 to .88 (Rosenberg, 1986), and were even higher in the current study ( $\alpha = .89-.93$ ).

Depressive symptoms is another important adjustment variable. The Center of Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) is a 10 item measure rated

on a 4-point likert scale ranging from “rarely or none of the time” to “most or all of the time.” Again, all items were summed to create a total CES-D score. Scores greater than 12 indicate the presence of mild to significant depressive symptoms (Cheng & Chan, 2005). It was found to have high internal consistency, adequate test-retest reliability, and construct validity through comparison with other self-report measures and clinical ratings of depression (Radloff, 1977). The CES-D demonstrated moderate to high reliability across the four data collection points in the study ( $\alpha=.77-.91$ ).

At Time 4, participants responded to a host of items aimed at assessing their subjective evaluation of the fall semester. Students were asked to provide their GPA for the fall semester as well as about their personal assessment of their performance in the first semester (“How satisfied are you with the GPA you have earned this semester?”). Additionally, they were asked to rate how their actual experience academically and socially related to their expectations prior to attending and how satisfied they were with their academic and social experiences during the fall semester. Composite scores were created for all items relating to social relationships as well as for all items associated with academics. Reliabilities for these two composite variables were moderate (Social  $\alpha = .67$ ) to high (Academic  $\alpha = .84$ ). See Appendix B for the full set of adjustment measures and scoring instructions.

## Results

### Characteristics of the Sample

To give a broader image of the pattern of results I will first describe the distribution of each of the variables of interest, before turning to the analysis of the three aims of the study. To better represent the distribution of responses I will report the mean and the 1<sup>st</sup> (Q1) and 3<sup>rd</sup> (Q3) quartiles for each variable across all sessions. Q1 estimates indicate that 25% of all responses are equal to or less than that value. Q3 estimates indicate that 25% of all responses are greater than that value. Stress was measured by the PSS and scores could range from 0 to 40. The mean for the PSS was 16.88, the Q1 estimate was 12, and the Q3 estimate was 21. Overall student stress scores were not very high with the distribution indicating ranges from low to moderate stress in general (i.e., these mean and quartile estimates fall under “Almost Never” to “Sometimes” on the PSS rating scale).

With regard to support, the SPS (scored from 24-96) also showed moderate responses with a mean of 66.64, a Q1 estimate of 61, and a Q3 estimate of 76. ISEL overall and subscale scores were much higher (i.e., indicative of greater support). The ISEL overall mean was 27.63, Q1 was 25, and Q3 was 33; scores could range from 0 to 36. Subscale scores ranged from 0 to 12 and the distributions were as follows: Appraisal M=9.63, Q1=8, Q3=12, Belongingness M=8.48, Q1=7, Q3=11, and Tangible M=9.52, Q1=8, Q3=11.

The appraisal score distributions were more moderate. Challenge appraisals were scored on a 0 to 36 scale. The mean for Challenge appraisals was 26.41 indicating overall trend toward challenge vs. threat appraisals, and the distribution was similarly challenge based (Q1=23 and Q3=30). Confidence appraisals were rated on a four-point scale (not prepared to fully prepared) and the average of the items was scored on a 0 to 4 scale. Confidence scores were moderate with a mean of 2.83, a Q1 estimate of 2.43, and a Q3

estimate of 3.14.

Finally, the adjustment variables for self-esteem and depressive symptoms (the RSE and the CES-D) both ranged from 0 to 30. RSE scores were moderate to high with a mean of 21.96, a Q1 estimate of 18, and a Q3 estimate of 26. Scores for the CES-D were relatively low. The overall mean was 8.97, the Q1 estimate was 5, and the Q3 estimate was 12. Recall that for this shortened version a cutoff score of 12 is indicative of mild depression.

### **Analytic Approach**

Traditionally, a repeated measures ANOVA approach would be used to analyze the data from a longitudinal study of this nature where both within- and between person processes are of interest; however, a mixed model approach has been cited as being better suited for the analysis of such data (e.g., Howell, 2007). A repeated measures ANOVA is able to account for the fact that individuals have multiple responses, but only in the service of describing the average process; however, it does not actually speak to the within-person process. Mixed models, also known as hierarchical linear models or multilevel models, allow for the examination of both within- and between-person processes. Such models contain both fixed effects, which represent average effects for the population, and random effects, which signify an individual's deviation from that population average effect. These random effects are assumed to be normally distributed in the population. Thus, the mixed model is well suited for describing an average process in the population, as well as quantifying individual differences in that process.

I also chose to employ a mixed model approach because it is not subject to two assumptions of the repeated measures analysis of variance: complete data and homogeneity of covariance (i.e., sphericity). First, I preferred a mixed model approach because of its flexibility in handling missing data. A repeated measures ANOVA does not allow for any

missing scale scores at any time-point, such that a participant missing an overall SPS score at Time 1, for example, would be excluded from the analysis completely, even if data was still available for all other time-points. A mixed model approach allows for an individual's score to be missing from one time-point while including their remaining data in the overall analysis. Over the course of the four time points a total of 18 participants withdrew from the study, providing no data for one or more sessions. Additionally, as with any study, participants were free to skip items or questionnaires they felt uncomfortable answering resulting in a variety of other missing pieces of data. Given that excluding all participants with missing scale scores would reduce the total number of participants included in the statistical analyses, I favored an approach that would allow me to maximize and use as much data as possible. Only 63 participants provided data at all time-points, so if a repeated measures analysis were utilized I would lose all additional data for the 18 subjects who failed to complete all four sessions. The use of a mixed model salvages that information and allows me to make use of all the data provided by participants even if it is incomplete.

Second, a mixed model approach is preferred here because of the way in which the sphericity assumption is addressed. In a repeated measures ANOVA, homogeneity of covariance (sphericity) is assumed (i.e., the inter-correlations of the residuals across time are constrained to be constant). If this assumption is violated, which it often is, the risk of Type I error increases (Howell, 2007). Several corrections exist to work around violations of the sphericity assumption (e.g., Greenhouse-Geisser, Huynh-Feldt), but these corrections do not apply to follow up tests. Thus, a correction may be used to account for this violation in a repeated measure ANOVA; however, any additional follow-up analyses are still at increased risk for Type I error. In a mixed model approach, correlations of residuals can be unconstrained, meaning that the sphericity assumption no longer needs to be met. The

advantage of this is not only a reduced risk of Type I error for initial tests, but also greater confidence in the integrity of follow-up analyses.

### **Normative Change over Time**

The longitudinal design allowed for the examination of stress, support, appraisal, and distress both at specific points in time as well as across the duration of the entire study. A mixed model procedure in SAS (SAS Institute Inc., 2010) was used to assess the change in each variable over time so that both the between-person (inter-individual) and within-person (intra-individual) effects could be examined.

**Stress.** Stress as measured by the PSS did change on average,  $F(3, 78) = 3.25, p = .03$ ; more specifically levels of stress increased from Time 1 ( $M = 15.99$ ) to Time 3 ( $M = 18.25, t(78) = -2.89, p = .03$ ) and from Time 2 ( $M = 16.38$ ) to Time 3 ( $M = 18.25, t(78) = -2.67, p = .04$ ). As expected, Time 3 represents a particularly stressful period for students as they have just finished mid-term exams and are preparing for final exams. A moderate level of stress was experienced prior to attending college and during the beginning of the semester which then increased towards the end of the semester. See Figure 3. Unexpectedly, stress levels did not differ between Time 1 and Time 2. Although I predicted that levels of stress would increase between these two periods, it appears that students did experience comparable levels of stress at Time 1 and Time 2, albeit different types of stress. It seems likely that Time 1 represents a period of anticipatory stress in relation to the college transition whereas Time 2 involves actual stressors related to the transitional period.

**Perceived Support.** On average there was a significant decrease in the SPS over time,  $F(3, 78) = 4.40, p < .01$ . This effect is driven by differences between Time 1 ( $M = 68.62$ ) and both Time 3 ( $M = 65.57, t(78) = 2.84, p = .03$ ) and Time 4 ( $M = 64.38, t(78) = 3.32, p < .01$ ) respectively. This indicates that across the semester there was a gradual decrease in

perceptions of support from the pre-semester baseline, although average support levels never dropped below the scale midpoint. This slight drop occurred during one of the most stressful periods of the semester, just after mid-terms but before final exams. See Figure 4.

There are three subscales of the ISEL that were assessed at each time point of the study; the Tangible, Belongingness and Appraisal subscales each contained 12 items with scores that could range from 0 to 12. There was no change on average for the Tangible support subscale, meaning that perceptions of support for specific events and concrete needs did not vary over time. Appraisal support did change on average,  $F(3, 78) = 2.81, p < .04$ . In particular, appraisal support increased from Time 2 ( $M=9.07$ ) to Time 4 ( $M=10.03, t(78) = -2.79, p = .03$ ), meaning that students' perceptions of emotional support increased across these two time-points. Belongingness support subscale scores also changed on average,  $F(3, 78) = 4.29, p < .01$ . In this case, Belongingness support scores increased from Time 1 ( $M=7.81$ ) to Time 2 ( $M=8.63, t(78) = -2.79, p = .03$ ) and from Time 1 to Time 4 ( $M=9.01, t(78) = -3.30, p < .01$ ). At Time 2, participants have moved into the dorms and have had some time to begin meeting and spending time with other students. It makes sense that their feelings of belongingness would increase from pre-orientation to the first weeks of the semester. Belongingness also increased from pre-orientation to the spring semester indicating that students felt substantially greater belongingness after the first semester had ended relative to before it began. See Figure 5.

There was significant change on average for the composite ISEL score,  $F(3, 78) = 3.28, p = .03$ , with an increase in support at Time 4 ( $M=29.01$ ) relative to Time 1 ( $M=27.70, t(78) = -2.95, p = .02$ ) and Time 2 ( $M=27.01, t(78) = -2.68, p = .04$ ) respectively. Participants' perceptions of support increased slightly at Time 4, although again their scores still indicated moderate to high levels of perceived support. Consistent with the results for

the ISEL belongingness subscale, it appears that by the spring semester students' overall perceptions of support have increased. See Figure 6.

**Appraisal.** Challenge appraisal ratings, a proxy for primary appraisal, did not change on average ( $F(1,189) = 1.47, p = .22$ ), see Figure 7. Secondary appraisal, interpreted here as confidence ratings, also did not change on average ( $F(3,186) = 1.35, p = .26$ ), see Figure 8. Given that both measures of appraisal were reliable, this suggests that perhaps appraisal processes are not systematically affected by the transition to college on average, although a greater depth of analyses and further correlational and experimental work would be needed to confirm this.

**Depressive symptoms & self-esteem.** The Rosenberg Self-Esteem Scale (RSE, Rosenberg, 1965) and the Center of Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977) were used as general measures of distress and well being with possible scores on both measures ranging from 0 to 30. The CES-D showed significant change over time ( $F(3, 77) = 4.06, p = .001$ ) in which depressive symptom scores increased marginally from Time 1 ( $M = 7.69$ ) to Time 2 ( $M = 9.15, t(77) = -2.49, p = .07$ ) and significantly from Time 1 to Time 3 ( $M = 10, t(77) = -3.42, p = .01$ ). See Figure 9. These means come close to, but do not surpass the cutoff point for depression on the scale which is a score of 12 (Cheng & Chan, 2005). Depressive symptoms increased at Time 3, one of the most stressful times in our examination period. For RSE scores there was a complementary pattern that was significant,  $F(3, 77) = 3.55, p = .02$ . More specifically, Time 1 ( $M = 22.82$ ) was marginally or significantly higher than all other time points (Time 2:  $M = 21.69, t(77) = 2.58, p = .06$ ; Time 3:  $M = 21.52, t(77) = 2.54, p = .06$ ; Time 4:  $M = 21.13, t(77) = 2.79, p = .03$ ). See Figure 10. Self-esteem dropped slightly after orientation, when students had started attending classes.

**Variability.** Despite the seeming lack of substantial normative change over time,

there were sizable between- and within-person differences for each of the above variables. To better demonstrate this variability, I examined the variance for each measure and partitioned it into variability attributed to chronic or stable individual differences, variability attributed to normative change over time (analogous to the previous set of analyses), and remaining variability, which encompasses individual differences in change over time and measurement error that cannot be separated from one another.

First, I calculated the total variance for each variable in the sample. Next, I ran a mixed model that would allow me to break down the variance into the three components mentioned above. The model included a main effect of time-point, a random intercept, and a residual term. The random intercept estimates the overall between-person variability in the outcome (i.e., that which can be attributed to chronic individual differences), and the residual estimates the remaining within-person variability after accounting for the average effect of time-point (i.e., a combination of variance due to individual differences in change over time and measurement error). In order to determine the variance due to normative change over time the random intercept and residual variance estimates were subtracted from the total variance.

When examining these factors, an overall pattern emerges suggesting the largest portion of variability (62-81%) for all measures can be attributed to chronic individual differences, a very small portion of variability (.1- 4%) can be attributed to normative change over time, and a substantial portion of variability (20-33%) remains. The amount of unspecified variability is high; however, given the moderate to high reliabilities for all of the above measures it is unlikely that the majority of this variance is due to measurement error. See Table 3 for the breakdown of variances for all measures.

**Summary.** Participant levels of stress, support, appraisal, and distress did not vary

greatly over the course of the semester when examined as normative change over time. Stress peaked during a very busy time of year just after mid-term exams and right before finals. Perceptions of support were generally high and with the exception of the SPS, increased over time. Finally, self-esteem decreased and depressive symptoms increased across the first semester. It is important to note that individual differences were great for all of the above variables demonstrating that participant's individual patterns of stress and support may not have been consistent with the normative trends outlined above.

### **Support: Home vs. College**

Swenson, Nordstrom, & Hiester (2008) examined adjustment to college in light of students' old/Home social network and new/College social network, suggesting that stability in support from old networks was key to initial success in a new environment, but that sustained adjustment required a deeper connection and integration into the new social environment. The study design allows for the examination of participants' dependence on supportive others both at Home and at College. Participants were asked to think about a specific person outside of the school environment (Home, all time points) and a person at College (only at Times 2, 3, and 4) that they were closest to and to answer a set of questions about the relationship and support with regard to that close other. Items of interest are the three types of support (Emotional, Informational, and Instrumental) and differences in the quality and nature of the different relationships. Again a mixed model approach was favored here in lieu of the traditional repeated measures ANOVA for the reasons described above.

Close other relationships from Home were mainly with best friends, significant others, parents, and siblings, while close other relationships at College were largely with friends, roommates, or hallmates. Participants were asked to indicate the amount of time they spent with each person, how often they communicated with each person, and how

positive or enjoyable these interactions were. Time and communication were rated on a 6-point scale and positivity was rated on a 5-point scale. Time spent with close others from Home significantly decreased over time,  $F(3,78)=29.32, p<.0001$ , with a drop in time spent together from Time 1 ( $M=5.27$ ) and all other time points (Time 2:  $M=4.15, t(78)=6.10, p<.0001$ ; Time 3:  $M=3.74, t(78)=7.78, p<.0001$ ; Time 4:  $M=3.69, t(78)=9.05, p<.0001$ ), as well as drop from Time 2 to Time 4 ( $t(78)=2.53, p=.06$ ). Time spent with a close other in the College network increased significantly,  $F(2, 68) = 3.53, p=.03$ , with marginal increases at Time 4 ( $M=5.97$ ) relative to both Time 2 ( $M=5.69, t(68) = -2.27, p=.07$ ) and Time 3 ( $M=5.90, t(68) = -2.17, p=.08$ ). Time spent with the College close other was always greater than time spent with the Home close other at Times 2, 3, and 4 at the  $p<.0001$  level. These patterns are consistent with students' move into the dorms among other students and away from parents and old friends. See Figure 11 for a graph of the changes in time spent with both Home and College close others.

Amount of communication between participants and Home close others also decreased slightly but significantly ( $F(3,78)=3.25, p=.03$ ), from Time 1 ( $M=5.69$ ) to both Time 3 ( $M=5.43, t(68)=2.62, p=.05$ ) and Time 4 ( $M=5.33, t(68)=2.66, p=.05$ ) respectively, and from Time 2 ( $M=5.62$ ) to Time 4 ( $t(68)=2.62, p=.05$ ). Change in communication with the College close other increased only marginally,  $F(2, 68) = 2.52, p=.09$ . See Figure 12 for a graph of the changes in frequency of communication with both Home and College close others. There was no change in how positive or enjoyable close others were for the Home or College social network, and scores were quite high for this item as expected (ranging from 4.33-4.51 out of 5), see Figure 13.

These findings suggest that although participants were somewhat less likely to spend time with close others at Home, the amount of communication was still high (5 on a 6-point

scale), and they still greatly enjoyed these interactions. Communication and positivity in relation to College close others were not measured at Time 1, and the results indicate that amount and positivity of interaction did not vary, which is understandable given participants are likely seeing close others on a daily basis. One might assume that these ratings should increase since participants were getting to know College close others and network members more intimately over the course of the semester, but the results suggest that, at least normatively, time does not seem to matter for these particular outcomes.

Next, ratings for each type of support (emotional, information, and instrumental), which were rated on a 5-point scale, were examined by social network over the four time points. See Figure 14 for a graph of changes in all three types of support for both the Home and College close other. Emotional support for both Home and College sources did not change significantly over time. However, Informational support showed significant change for both the Home ( $F(3, 78) = 5.10, p = .003$ ) and College ( $F(2, 68) = 6.49, p = .003$ ) close other. Informational support from Home increased from Time 1 ( $M = 4.1$ ) to Time 2 ( $M = 4.49, t(78) = -3.76, p = .002$ ) and decreased from Time 2 ( $M = 4.49$ ) to Time 4 ( $M = 4.21, t(78) = 2.94, p = .02$ ) indicating that early in the transition, students relied more heavily on their Home network for information but that this dependence decreased over time. It could be that the type of information most needed by students was not within a parent's expertise (e.g., questions about classes, Lehigh procedures and protocol, how to study, issues with specific social or romantic partners, etc.). Perhaps members of the College network were more apt to answer these types of questions or since this network was more immediate to participants these types of issues were addressed and resolved prior to reaching the Home network. Informational support at College increased from its first assessment at Time 2 ( $M = 3.67$ ) to Time 3 ( $M = 4.1, t(68) = -3.25, p = .005$ ) demonstrating participant's growing

reliance on the new school network for this type of support.

Similarly, instrumental support also showed significant change over time for both Home ( $F(3, 78) = 7.30, p = .0002$ ) and College ( $F(2, 68) = 6.18, p = .0034$ ). Instrumental support from the Home close other increased significantly from Time 1 ( $M = 3.88$ ) to all other time points (Time 2:  $M = 4.3, t(78) = -3.50, p = .0018$ ; Time 3:  $M = 4.26, t(78) = -3.28, p = .0082$ ; Time 4:  $M = 4.37, t(78) = -4.11, p = .0006$ ). Consistent with the pattern for information support, instrumental support from the College close other increased from Time 2 ( $M = 3.51$ ) to Time 3 ( $M = 3.84, t(68) = -2.98, p = .01$ ).

Specific contrasts demonstrated that within each type of support and each time point, support from the Home close other was always significantly greater than support from the College close other to the  $p < .01$  level, with the exception of informational support at Time 3 which was only marginally significant ( $p = .08$ ). Despite this, the trends above demonstrate that while support from the old/Home network is an abundant resource it seems to decrease over time as support from College increases, at least on average.

**Variability.** Again there was not much substantial change in the type of support or relationship quality with support figures over time, so the within-person variability for each measure was examined. Recall that variability here can be attributed to chronic individual differences, normative change over time, and remaining variability, which combines individual differences in change over time and measurement error. Similar to the previous section on, the smallest portion of variability could be attributed to differences in normative change over time (.1-3.9%) with the exception of time spent with a Home support figure of which was almost 20% of the variability was attributed to normative change over time. At Time 1 students were likely spending time with support figures from Home on a daily or weekly basis, but all other time-points reflected the fact that students had moved out of their

home towns and into the dorms and thus might only be seeing close others from Home monthly or even less. Thus, the fact that a significant portion variance can be attributed to average differences across session is not surprising.

For type of support (e.g., emotional, instrumental, and informational), regardless of source, variability is almost evenly split between individual differences (45-60%) and the combination of individual differences in change over time and measurement error (37-52%). Ratings about the amount of time spent and frequency of communication with support figures (for both Home and College) showed similar patterns with less variability attributed to individual differences (28-40%) and greater variability that was a combination of individual differences in change over time and measurement error. The positivity associated with each support figure, regardless of network, demonstrated an even split between variability due to individual differences (44-50%) and remaining variability (50-54%). See Table 4 for the breakdown of variability for all relational qualities by network.

**Summary.** The support figures from both Home and College are both highly available to students. They spend time or communicate with close others from both networks a great deal and enjoy these interactions. Levels of emotional, informational, and instrumental support were all moderately high. Participants showed an initial increase in both informational and instrumental support after the semester began. Informational support from Home then decreased while instrumental support continued to increase. Informational and instrumental support from the College close other was elevated from the beginning of the semester to the post-mid-term period suggesting that meaningful social relationships developed during this time.

Overall, Home support was always greater than College support, although support from the College network continued to grow throughout the semester. The within-person

variability for ratings of supportiveness and the quality of close other relationships was quite small, but what variability did exist was for the most part evenly attributed to individual differences and a combination of individual differences in change over time and measurement error. The results suggest that students use the Home network as necessary to safely and successfully navigate stress while developing the more proximal College network.

### **The Stress Buffering Hypothesis**

The main purpose of the study was to test the Stress Buffering Hypothesis (Cohen & Wills, 1985) using a longitudinal design that encompassed an ongoing stressful situation. Stress buffering means that higher levels of perceived support should weaken the stress-distress relationship, while lower levels strengthen it (moderation; see Figure 1) and this relationship should be demonstrated by the interaction of stress and support noted by Cohen and Wills (1985). Most examinations of stress buffering attempt only to find this interaction of stress and support. However, a careful reading and integration of the literature, especially Cohen and Wills (1985), suggests additional associations to be tested. It is important to determine that stress buffering is occurring, but there have also been specific predictions about how and why buffering occurs (Barrera, 1986; Cohen & Wills, 1985; Rodriguez & Cohen, 1998). The indirect cognitive path mentioned by Cohen and Wills (1985) suggested that the way in which perceived support buffered stress was by altering one's appraisals of stressors (mediation). Taken together these pieces indicate that stress buffering via appraisal should be shown by a mediated moderation (See Figure 2); perceived support is expected to moderate the association between stress and distress (buffering) and appraisal should mediate the influence of perceived support on the stress-distress relationship.

Despite discussing findings in terms of between-person effects (e.g., Participants are

high or low in perceived support), prior work generally cannot be certain that these effects are actually being isolated. The certainty of the language in these studies is unwarranted as cross-sectional or longitudinal designs with just two time-points, the most common designs in the social support literature, do not provide the type of data that would allow one to distinguish between- and within-person effects. When these effects are not separable, it is impossible to know whether participant responses are due to stable characteristics (e.g., Joe tends to experience high levels of stress most of the time) or to particular events surrounding data collection (e.g., Joe broke up with his girlfriend the previous day and this has increased his stress ratings above and beyond his normal level). The longitudinal design of the present study does allow for the separation of these two types of effects, meaning that in addition to the between-person process being clarified, the existence and operation of the within-person stress buffering process can also be examined. I have chosen to present data from both approaches to examine how findings might change depending on the data analytic techniques used.

To approximate the analysis from a typical cross-sectional design Model I contained predictor variables that had been centered around the variable's grand mean (i.e., averaged across participants and sessions). Here the within- and between-person effects are not separable. Model II separated each observation into two components: Stable, between-person averages, and the individual's deviation from his or her average in a given session. The inclusion of these two components allowed for the separation, analysis, and interpretation of both within- and between-person effects.

In Model II between-person effects express differences between those who report chronically higher levels of perceived support and stress relative to those who report chronically lower levels of perceived support and stress. Within-person effects illustrate how

variability in support and stress within a given individual over time relates to changes in distress. By separating these two distinct aspects of the buffering process I can determine if assessments are simply occurring at particularly vulnerable times or if participants generally have a higher or lower chronic levels of perceived support and stress.

First, the Buffering Hypothesis was examined using the conventional stress-by-support interaction criterion. In these analyses, the PSS represented stress, the Support composite score represented perceived support, and several different adjustment outcomes were scrutinized to ensure that the analysis was comprehensive. These were self-esteem (RSE), depressive symptoms (CES-D), and the social and academic subjective adjustment outcomes assessed at Time 4. Where multiple time-points of adjustment variable responses were collected (RSE and CES-D) both models were utilized. The lack of multiple measures for subjective adjustment outcomes precluded the use of Model II for these variables.

Next, session was introduced as a possible proxy for stress. Given that data collection times were carefully selected to accompany meaningful periods during the semester, it seemed likely that session might also be an important indicator of stress. Finally, the full mediated moderation buffering model was tested, again using the Model I and Model II distinction. For these analyses, stress and support were the same as the previous conventional buffering tests, but only self-esteem and depressive symptoms were input as adjustment outcome variables. Each of these sets of associations was examined with the two appraisal types referenced earlier: Challenge and Confidence.

**Depressive symptoms and self-esteem.** When Model I was used to investigate buffering, with CES-D as the adjustment outcome variable, there was a significant main effect of stress ( $b=.41$ ,  $t(67) = 9.24$ ,  $p < .0001$ ) indicating that depressive symptoms increased as stress increased for those with an average level of perceived support. A significant main

effect of perceived support was also found ( $b=-3.81$ ,  $t(62)=-6.19$ ,  $p<.0001$ ) such that those with an average level of stress showed decreases in depressive symptoms as support increased. The interaction of stress and perceived support was also significant ( $b=-.21$ ,  $t(55)=-3.24$ ,  $p=.002$ ). This indicates that the relationship between stress and depressive symptoms is weaker for those higher in perceived support. In other words, people with higher levels of support experience fewer depressive symptoms in response to stressors than those low in perceived support. Thus, stress buffering, as indicated by the stress-by-support interaction criterion, is observed.

Model II allows for the separation of the within- and between- person effects. For the within-person processes, there were significant main effects of stress ( $b=.28$ ,  $t(65)=5.03$ ,  $p<.0001$ ) and support ( $b=-5.38$ ,  $t(62)=-5.37$ ,  $p<.0001$ ). This means that at times when stress was higher than normal for an individual, depressive symptoms were elevated, and at times when support was higher than normal, depressive symptoms were lowered. The within-person interaction of stress and support was non-significant ( $b=-.06$ ,  $t(55)=-.26$ ,  $p=.80$ ) meaning that within-person changes in perceived support did not alter the strength of the stress-distress relationship. Variability in perceived support over time did not alter the association between stress and depressive symptoms.

The between-person processes show a similar pattern, with significant main effects of stress ( $b=.61$ ,  $t(55)=10.63$ ,  $p<.0001$ ) and perceived support ( $b=-2.57$ ,  $t(55)=-2.91$ ,  $p=.01$ ), and a non-significant interaction ( $b=-.09$ ,  $t(55)=-.88$ ,  $p=.38$ ). The significant main effects indicate that those who had generally higher levels of stress had higher levels of depressive symptoms and that those who had generally higher levels of perceived support had lower levels of depressive symptoms. The non-significant interaction implies that chronic differences in levels of perceived support did not moderate the stress-distress

relationship. In other words, stress-by-support interactions were not found at either the between-or within-person levels, and thus according to the Cohen and Wills (1985) criterion, stress buffering was not observed. Psychologically this means that the association between stress and depressive symptoms did not differ systematically for individuals generally high versus low in perceived support.

A similar pattern is apparent for self-esteem. When the RSE was used as an adjustment outcome variable, Model I again yielded a significant main effect of stress ( $b = -.21$ ,  $t(67) = -4.87$ ,  $p < .0001$ ), such that those with an average level of support showed a reduction in self-esteem as stress increased. There was also a significant main effect for perceived support ( $b = 3.77$ ,  $t(63) = 5.55$ ,  $p < .0001$ ), indicating that those with an average level of stress showed an increase in self-esteem as support increased. The interaction of stress and support here was marginally significant ( $b = .13$ ,  $t(56) = 1.93$ ,  $p = .06$ ), with this trend supporting the operation of stress buffering. Just as with depressive symptoms, the relationship between stress and self-esteem was weakened as perceived support increased. Thus, the greater amount of support that was perceived, the weaker the negative association was between stress and self-esteem.

For Model II, consistent with the results for the CES-D, the main effects of stress ( $b = -.13$ ,  $t(65) = -2.48$ ,  $p = .02$ ) and perceived support ( $b = 3.35$ ,  $t(63) = 3.37$ ,  $p < .0001$ ) were significant for the within-person processes. At times when perceived support was high, self-esteem increased. During periods when there stress levels were elevated, self-esteem decreased. Once more, the within-person interaction of stress and support was non-significant ( $b = .25$ ,  $t(56) = 1.17$ ,  $p = .25$ ), meaning that perceived support did not moderate the stress-distress association. Greater perceptions of support over time were not associated with the strength of the relationship between stress and feelings of self-esteem.

Between-person effects largely show the same pattern as with depressive symptoms, with significant main effects of stress ( $b=-.42$ ,  $t(56)=-6.10$ ,  $p<.0001$ ) and support ( $b=4.60$ ,  $t(56)=4.34$ ,  $p=.0001$ ). For people with a generally high level of stress, self-esteem was lower, and for those with a generally high level of perceived support, self-esteem was higher. However, the stress-by-support interaction term for the between-person effects was significant ( $b=-.25$ ,  $t(56)=-2.16$ ,  $p=.04$ ). Note that the estimates for the within- and between-person interactions differed in sign (.25 relative to -.25). The within-person effect, although not significant, shows a trend indicative of buffering wherein support benefits those with higher level of stress. For the between-person process, however, the interaction is such that those with *low* stress and high support have greater self-esteem, almost an anti-buffering effect (See Figure 15). Those with chronically high levels of perceived support showed a weaker relationship between stress and self-esteem than those with low perceived support.

These findings suggest that study design is critical for finding the stress-by-support interaction indicative of a stress buffering effect. When a more traditional approach that cannot distinguish within-person processes is used (Model I), this interaction seems to emerge. However, when a longitudinal design allows for within-person effects to be isolated (Model II) the interaction disappears (with the exception of the between-person effects for self-esteem). It seems that something is being lost when between- and within-person effects are combined. Isolating these processes provides greater detail about the associations between stress, distress, and perceived support by allowing for the examination of results by time and by person. However, it could be that the separation of these processes reduces the power of the analysis making it more difficult to detect significant interactions of stress and support.

Although significant findings were produced through the use of Model I, there is theoretical support for favoring a Model II approach with data of this nature (Raudenbush & Bryk, 2002; Enders & Tofghi, 2007). The stress-by-support interaction was not found for depressive symptoms under Model II, but there was a significant between-person interaction of stress and perceived support in relation to self-esteem under these conditions. The results here are complex and conflicting, but the support for stress buffering is neither consistent nor overwhelming.

**Subjective adjustment outcomes.** In an effort to test the Stress Buffering hypothesis as thoroughly as possible, additional adjustment measures were identified. It has already been mentioned that students have their own subjective standards by which they evaluate their performance (Yazedijan, Toews, Sevin, & Purswell, 2008). At Time 4 additional items were added to solicit students' satisfaction with their emotional, social, and academic experience as well as to determine how their actual experience matched with their expectations at the beginning of the study. Here, composite ratings for social and academic adjustment outcomes will be examined separately. Because these adjustment variables were only measured at one time point within-person effects could not be specified, thus only the Model I approach was employed here.

For social adjustment, there were significant main effects of stress ( $b = -.03$ ,  $t(224) = -4.17$ ,  $p < .0001$ ) and perceived support ( $b = .30$ ,  $t(224) = 2.81$ ,  $p = .01$ ), but the interaction term was not significant ( $b = .0003$ ,  $t(224) = .02$ ,  $p = .98$ ). For those with an average level of perceived support, increases in stress were accompanied by decreases in satisfaction with the social experience. For those with an average level of stress, increases in perceived support were associated with increases in satisfaction with the social experience; the association between stress and social adjustment did not vary as a function of perceived support.

With regard to academic adjustment there was a significant main effect of stress ( $b = -.03$ ,  $t(224) = -3.48$ ,  $p = .0006$ ) and a non-significant interaction ( $b = .01$ ,  $t(224) = .73$ ,  $p = .47$ ) consistent with the findings for social adjustment. However, in this case the main effect of support was also not significant ( $b = -.09$ ,  $t(224) = -.84$ ,  $p = .40$ ). Only decreases in satisfaction with academic adjustment were associated with increases in stress for those with an average level of perceived support. An interaction of stress and support, indicative of stress buffering, was not found in relation to academic adjustment.

Even with the use of the more traditional model that has found the classic stress-by-support interaction for adjustment outcomes such as self-esteem and depressive symptoms, no interaction is observed for students' subjective satisfaction with their social and academic experiences during the fall semester.

**Session as a proxy of stress.** Data collection time periods were carefully selected to capture different aspects of and events related to the transition from high school to college. It therefore seemed that session itself could represent a proxy for the measurement of stress in these analyses. In particular, Time 3 was believed to be the most stressful period of data collection in the entire study, and it seemed likely that stress buffering, in the form of an interaction of session and support, would be found at Time 3 relative to all other time points. None of the resulting support-by-session interactions were significant. For self-esteem, depressive symptoms, academic adjustment, and social adjustment no classic stress buffering effects emerged for Model I or for Model II analyses.

**Stress buffering via appraisal.** A major aspect of the stress buffering hypothesis yet to be examined in the literature is whether appraisal is the mechanism by which perceived support actually operates to diminish the effect of stress on distress. Cohen and Wills (1985) proposed that appraisals should be influenced by perceptions of support and

that it was this relationship that in turn reduced the impact of stress. In other words, having high levels of perceived support should actually change the way in which stressors are perceived such that they should be viewed as challenges instead of threats (i.e., excitement and anticipation should be felt instead of anxiety and worry). Alternately, personal resources should be evaluated as being sufficient to handle the stressor when perceived support is higher. Both primary (Challenge) and secondary (Confidence) forms of appraisal were examined.

In order to demonstrate that Stress Buffering was operating through appraisal adjustment certain contingencies had to be met (Muller, Judd, & Yzerbyt, 2005). First, stress and support have to be shown to interact to predict the adjustment variables (depressive symptoms or self-esteem); this step involves meeting the standard criterion set by Cohen and Wills (1985) and was already described above for both Model I and Model II. Stress buffering interactions were generally observed when Model I was utilized but there was less consistency under Model II with stress-by-support interactions emerging for self-esteem but not for depressive symptoms. Because interactions of stress and support were not observed for subjective adjustment outcomes, even with Model I, and because session was not an appropriate proxy for stress, these measures will be excluded from further analyses. Additionally, given that this initial step is a necessary prerequisite for proceeding with the steps in this analysis, models in which the support-by-stress interaction was not observed at this first stage will not be discussed further.

As a second step towards demonstrating stress buffering via appraisal, support must be shown to predict appraisal (Challenge or Confidence). Third, stress and appraisal should interact to predict the relevant adjustment variable. Fourth and finally, the interaction of stress and support as well as the interaction of stress and appraisal are included in the same

model. The interaction of perceived support and stress should be reduced when appraisal is included in the analysis. Specifically, I compared the interaction of stress and support from the first analysis with the same interaction in the fourth analysis to determine if the moderating impact of support had changed. If this interaction is reduced when appraisal is included in a full model then the hypothesis that perceived support buffers the full impact of stress by altering one's appraisals of said stress is strengthened. Due to the large number of terms involved in these analyses only the pertinent interaction terms will be reported below.

***Challenge appraisal.*** With regard to the CES-D, in Model I stress buffering via appraisal was not supported. The results are as follows: 1) Recall that stress interacted with support to predict depressive symptoms ( $b=-.21$ ,  $t(55)=-3.24$ ,  $p = .002$ ); 2) Support predicted challenge appraisals ( $b=3.90$ ,  $t(68)=5.80$ ,  $p<.0001$ ); 3) Stress and challenge appraisal interacted to predict depressive symptoms ( $b=-.02$ ,  $t(55)=-2.32$ ,  $p = .02$ ); 4) The support-by-stress interaction remained significant ( $b=-.23$ ,  $t(53)=-2.88$ ,  $p = .006$ ). The key elements of the analysis above are the estimates of the support-by-stress interaction without challenge appraisal (Set 1:  $b=-.21$ ) and with challenge appraisal (Set 4:  $b=-.23$ ). There is virtually no change in the estimates, indicating that the moderating role of support on the stress-distress association is not explained by challenge appraisal. There is no evidence of a mediated moderation, although the analysis above still supported stress buffering using the criterion set by Cohen and Wills (1985) which does not include appraisal. See Table 5.

A test of the same outcome variable using Model II (where within- and between-person effects can be separated) showed no stress-by-support interactions for either the within- ( $b=-.06$ ,  $t(55)=-.26$ ,  $p = .80$ ) or between- ( $b=-.09$ ,  $t(55)=-.88$ ,  $p = .38$ ) person effects. Since the initial step of showing stress buffering through a stress-by-support interaction was not achieved moving forward with further analyses to illustrate stress buffering via appraisal

is unwarranted. See Table 6.

When self-esteem (RSE) was used as an adjustment variable with Model I, results were slightly different than those for depressive symptoms. 1) The interaction of stress and support to predict self-esteem was marginally significant ( $b=.13$ ,  $t(56)=1.93$ ,  $p = .06$ ); 2) Support predicted challenge appraisals ( $b=3.90$ ,  $t(68)=5.80$ ,  $p<.0001$ ); 3) Stress and challenge appraisals interacted to predict self-esteem ( $b=.01$ ,  $t(56)=2.10$ ,  $p = .04$ ); 4) The stress-by-support interaction became non-significant ( $b=.002$ ,  $t(54)=.02$ ,  $p = .98$ ). These results are suggestive of buffering via appraisal, meaning that part of the reason that stress has less of a negative association with self-esteem is because having a higher sense of perceived support is associated with appraising situations as more challenging (and therefore less threatening). However, the lack of significance of the stress-by-appraisal interaction term in the final model questions this conclusion. See Table 7.

For Model II: 1) A stress-by-support interaction was not found for within-person effects ( $b=.25$ ,  $t(56)=1.17$ ,  $p = .25$ ). However, this interaction was significant for the between-person effects ( $b=-.25$ ,  $t(56)=-2.16$ ,  $p = .04$ ). 2) Support predicted challenge appraisals between- ( $b=6.17$ ,  $t(121)=6.64$ ,  $p <.0001$ ) persons; 3) Stress did not interact with challenge appraisals to predict self-esteem for the between-person effects ( $b=-.001$ ,  $t(55)=-.10$ ,  $p = .92$ ); 4) Stress did interact with support to predict self-esteem between-persons ( $b=-.29$ ,  $t(54)=-2.36$ ,  $p = .02$ ). Stress buffering was not observed at all for the within-person process, and although stress buffering was initially supported between-persons the initial estimate for the stress-by-support interaction (Set 1:  $b=-.25$ ) did not change substantially when appraisal was included in the final step (Set 4:  $b=-.29$ ). When stable differences and changes over time were separable, perceptions of support were not associated with the relationship between stress and self-esteem via differences in how challenging participants

viewed their current circumstances.

Interestingly, despite the lack of a stress-by-support interaction for the within-person processes, there was a significant within-person stress-by-appraisal interaction ( $b=.05$ ,  $t(54)=3.00$ ,  $p<.004$ ). This indicates that increases in challenge appraisal over time are associated with a stronger negative relationship between stress and self-esteem. Without the separation of within- and between-person effects this interaction would be impossible to detect. These results suggest that mediation by appraisal may not emerge for challenge appraisals because there is appraisal “buffering” occurring at the within-person level, whereas support buffering seems to occur only at a between-person level. See Table 8. Perhaps appraisal does not represent a stable or chronic characteristic (like perceived support is believed to), but is much more susceptible to context and moment-to-moment changes in mood, stress, etc.

***Confidence appraisals.*** Model I tests of depressive symptoms in relation to confidence appraisals showed support for stress buffering, but not buffering via appraisal. 1) Stress interacted with support to predict depressive symptoms ( $b=-.21$ ,  $t(55)=-3.24$ ,  $p = .002$ ); 2) Support predicted confidence appraisals ( $b=.36$ ,  $t(68)=4.52$ ,  $p<.0001$ ); 3) Stress and confidence appraisal interacted to predict depressive symptoms ( $b=-.17$ ,  $t(55)=-2.95$ ,  $p = .005$ ); 4) The support-by-stress interaction remained significant ( $b=-.19$ ,  $t(52)=-2.73$ ,  $p = .009$ ), but the change in estimates was not substantial enough to indicate mediated moderation (Set 1:  $b=-.21$ ; Set 4:  $b=-.19$ ). Consistent with the pattern of results for challenge appraisals and depressive symptoms, stress buffering (via the stress-by-support interaction) was observed, but there was no evidence of mediated moderation. See Table 9.

Model II results for confidence appraisals are also consistent with those for challenge appraisals. 1) No general stress buffering effect was found for within- ( $b=-.06$ ,  $t(55)=-.26$ ,  $p$

= .80) or between- ( $b = -.09$ ,  $t(55) = -.88$ ,  $p = .38$ ) person effects, Stress buffering was not observed in the initial step indicating that continuing with the stress buffering via appraisal analysis is inappropriate. See Table 10. So, for both Model I and Model II, perceived support was not associated with a weakening of the relationship between stress and depressive symptoms through its association with participant's appraisals of their own ability to deal with stressful situations.

The pattern of data for self-esteem and confidence appraisals using Model I was consistent with findings for challenge appraisals. 1) The interaction of stress and support to predict self-esteem was marginally significant ( $b = .13$ ,  $t(56) = 1.93$ ,  $p = .06$ ); 2) Support predicted confidence appraisals ( $b = .36$ ,  $t(68) = 4.52$ ,  $p < .0001$ ); 3) Stress and confidence appraisals did not interact to predict self-esteem ( $b = .07$ ,  $t(56) = 1.20$ ,  $p = .24$ ); 4) The support-by-stress interaction became significant ( $b = .14$ ,  $t(53) = 1.97$ ,  $p = .05$ ). A marginal overall stress buffering effect was observed, but since the estimates did not change substantially with the inclusion of appraisal (Set 1:  $b = .13$ ; Set 4:  $b = .14$ ) there was no support for mediated moderation. See Table 11.

For Model II: 1) Again, there was no general stress buffering effect for the within-person effects ( $b = .25$ ,  $t(56) = 1.17$ ,  $p = .25$ ), but stress buffering was observed between-persons ( $b = -.25$ ,  $t(56) = -2.16$ ,  $p = .04$ ); 2) Support predicted confidence appraisals significantly for the between-person effects ( $b = .46$ ,  $t(121) = 4.79$ ,  $p < .0001$ ); 3) Stress did interact with confidence appraisals to predict self-esteem for the between-person effects ( $b = .27$ ,  $t(55) = -2.28$ ,  $p = .03$ ); 4) Stress did interact with support to predict self-esteem for the between-person effects ( $b = -.26$ ,  $t(52) = -2.20$ ,  $p = .03$ ), although mediated moderation is not supported given the lack of change in the support estimates (Set 1:  $b = -.25$ ; Set 4:  $b = -.26$ ). Stress buffering and mediated moderation were not found for the within-person effects,

and although an overall stress buffering effect emerged for the between-person effects, mediated moderation was not supported. See Table 12. Again, regardless of which model was tested, associations with how participants viewed their ability to deal with stress was not the way in which perceived support buffered the impact of stress on self-esteem.

***Appraisal and perceived support.*** Although the association between perceived support and appraisal was not a primary focus of the preceding analyses, it is worth noting that these two support constructs were highly related regardless of whether or not stress buffering or stress buffering via appraisal was demonstrated. In both models, perceived support was positively associated with each type of appraisal at the  $p < .01$  level with only one exception. The association between support and confidence appraisal was only marginally significant ( $p = .09$ ) for the within-person effects. These results indicate that the novel measures of appraisal created for this study are relevant and informative to the social support process given their strong connection to reliable and valid measures of perceived support. General beliefs about the availability of others are highly associated with how individuals frame stress (e.g., as challenging or threatening) and view their coping options (e.g., their confidence in their own abilities to handle a stressful situation).

**Summary.** The dual aims of this set of analyses were to examine stress buffering in general and to evaluate appraisal as a possible mediator of perceived support and the stress/distress relationship. There were mixed findings with regard to stress buffering, but there was no evidence suggesting that appraisal was a mechanism of perceived support. The importance of separating within- and between-person processes was demonstrated by the fact that Model I and Model II analyses produced vastly different results. In Model I the stress-by-support interaction was observed for both depressive symptoms and self-esteem, but in Model II this interaction was only significant for the between-person interaction of

stress and support in relation to self-esteem. Stress buffering was not observed for subjective adjustment outcomes or when session was included as a proxy for stress. Appraisal was evaluated as a possible mechanism of perceived support in a mediated moderation model. Results for were consistent for Model I and Model II: appraisal did not mediate the association between perceived support and the stress/distress relationship. Explanations for and implications of these findings will be presented in the discussion.

## **Discussion**

The current study has contributed to two separate literatures, and has done so in both theoretical and applied ways. It has provided great detail about the student experience and the transitional period between high school and college. Moreover, it represents a meticulous longitudinal examination of a long-assumed yet inadequately examined social support theory, the Buffering Hypothesis (Cobb, 1976; Cohen & Wills, 1985). An ideal non-experimental examination of this phenomenon would be a longitudinal design with at least three data collection periods that assesses stress and support processes on-line as they are occurring in a naturalistic setting. The present undertaking meets all of these conditions, and to my knowledge is one of the most thorough, inclusive, and exhaustive evaluations of stress buffering to date. Despite this comprehensive approach and the attempt at examining this process under optimal conditions, there are of course limitations of the current study which will be discussed shortly.

### **Normative and Person-Specific Change during the First Year of College**

The first aim of the study was to track the normative change of several important predictor and adjustment variables over the course of the semester. Although these analyses revealed some significant changes, these factors were relatively stable on average and no drastic peaks or drops were noted. Stress increased slightly from the pre-orientation to post-mid-term period. I initially predicted an increase in stress from pre-orientation to the beginning of the semester but T1 and T2 stress levels were not significantly different from one another. Perhaps, it is not the amount of stress that changes, but the type of stress experienced. Prior to attending, students can only imagine what this transition will be like, anticipatory stress. This type of stress can be troubling because perceptions of what might happen and how good or bad things will be. These perceptions can make an impending

event seem larger than life. Upon arrival, students should quickly adapt to their environment and get a more realistic view of the stressors they will face, which can still be overwhelming. Researchers may need to focus more attention on this anticipatory period. One might assume that it is less stressful or devoid of stress, but the current data indicate that students do experience stress during the pre-college period.

Changes in perceived support varied by measure with slight decreases on the SPS and minor increases for the Belongingness and Appraisal subscales of the ISEL. There were increases in overall ISEL scores from pre-orientation/early semester assessments to the spring follow-up collection period. Meanwhile, challenge and confidence appraisals remained stable across the four time-points. Depressive symptoms increased slightly across this same period, while self-esteem decreased from the beginning to end of the study. Clearly the pre-orientation and post-mid-term periods represented critical points in the semester where students experienced some of the largest effects of almost all of the above variables.

Despite a lack of considerable change over time on average, there was a large amount of variability at the between- and within-person levels for all of the variables included in the study. The largest amount for all could be attributed to chronic individual differences; however, a substantial percentage (20-37%) was due to a combination of individual differences in change over time and measurement error. Given the high reliabilities for these measures within the present study and their consistent reliability and validity across a whole host of other work (with the exception of the novel appraisal measure), it seems unlikely that measurement error is primarily responsible for this variance. In other words, the data suggest a high degree of variability in individuals' patterns of change over time.

Ultimately, the study shows that stress and coping constructs are both stable and

variable. Perceived support is often assumed to be a stable and unvarying characteristic, and is both discussed and examined by researchers in a manner consistent with this assumption. In the current study, perceived support was similar in stability to all of the other variables measured (i.e., stress, appraisal, self-esteem, and depressive symptoms) yet all of those are thought to be quite variable and situation specific. Future endeavors should examine the malleability and context dependent nature of perceived support in greater detail.

A second aim of the current study was to assess the quality of supportive relationships both at home and at college. One major component of this transition is the need to balance maintaining relationships with family and old friends while also attempting to form new relationships in the current social environment. Overall, supportive others from the home network were always rated as being more supportive than close others from the college network, although ratings for both were above the mid-point of the scale and reflect that others were somewhat or very supportive across all four time-points. Perceptions of emotional support did not vary, but both instrumental and informational support increased from the pre-to post-orientation period for the home close other and from post-orientation to post-mid-terms for the college close other. Students are seemingly taking advantage of both networks during critical periods of the transition, particularly early on in the transitional period.

The quality of the relationships in each network was high. This makes sense since students were asked to select the person within each network that they were closest to. Although participants spent less time with home close others and more with college close others across the semester, communication with both home and college close others increased and enjoyment of the relationship remained stable for both networks across the study. Variability in these factors was much more evenly split between chronic individual

differences and unattributable variance (i.e., individual differences in change over time and measurement error). Again, since students selected the targets that were to be rated for both of the support networks it is unsurprising that individual differences accounted for such a large proportion of the variability.

### **Stress Buffering (via Appraisal)**

The third and final aim was to provide a thorough examination of the stress buffering hypothesis, for which the proposed mechanisms have yet to be identified satisfactorily. Two issues of analysis quickly emerged that changed the way in which the data were approached as well as the interpretation of the results. The first involved the data analytic technique to be used. Traditionally, researchers have designed studies and analyzed data in ways that did not allow for the between- and within-person effects to be distinguished from one another. More recently, a mixed model approach has been highlighted as more appropriate for longitudinal data (the preferred methodology for social support questions) due to features that enable one to examine incomplete data sets more easily and avoid increases in Type 1 error for follow-up tests (Raudenbush & Bryk, 2002). An additional advantage is the mixed model's capacity to separately analyze between- and within-person effects. In an effort to understand how the implications and interpretation of data from this traditional approach might differ from one where these processes can be isolated, both were included and reviewed above.

The second issue related to the standards to be met to demonstrate that a stress buffering effect was observed. Cohen and Wills (1985) alleged that an interaction of stress and support would be sufficient to show stress buffering, and for almost thirty years this has been the only criterion used by social support researchers to support the Buffering Hypothesis. The failure to consider the mechanisms responsible for this effect is problematic

because much of this work is cross-sectional or correlational so stress-by-support interactions can only describe the association between support, stress, and distress but cannot provide any information about the causal relationships amongst them. The Buffering Hypothesis is inherently causal, but current statistical criteria to demonstrate this effect do not adequately address these claims given the current preferred methodology in the field.

Lazarus and Folkman (1984) introduced several types of appraisal and social support researchers proposed that it was the influence support had on these cognitions that led to a significant change in the stress-distress relationship (Barrera, 1986; Cohen & Wills, 1985; Rodriguez & Cohen, 1998). In statistical terms this implies a mediated moderation of appraisal on perceived support's association to stress and distress. Although appraisal is just as well established as stress buffering, it has not been incorporated into examinations of the stress buffering hypothesis in the majority of cases. It has been studied separately much of the time, but even when it has been included it has not been framed as part of the mediated moderation model suggested by a careful reading of Cohen and Wills (1985).

These two issues caused me to take a broader approach to the examination of stress buffering than is normally undertaken. I chose to test each set of associations under conditions where between- and within-person effects were combined (Model I) as well as separated (Model II). I also chose to examine both the standard criterion established by Cohen and Wills (1985) and my own mediated moderation interpretation of their claim that appraisal was a possible mechanism for perceived support. I did this in order to present the most thorough test of these hypotheses as possible, and despite yielding a large number of analyses and complex results this diligence has led to one of the most comprehensive examinations of stress buffering in a naturalistic setting to my knowledge.

The choice of data analytic technique critically altered the pattern of results that

emerged for the two main adjustment outcome variables: self-esteem and depressive symptoms. Subjective adjustment could only be tested using Model I, and the necessary stress-by-support interactions were not found; Buffering effects also failed to surface when session was used as a proxy for stress. Initially, only the standard criterion (i.e., the interaction of stress and support) was used to determine whether stress buffering had occurred in relation to self-esteem and depressive symptoms. When the data were analyzed using Model I, this interaction emerged, but when within- and between-person effects could be separated in Model II, this interaction was no longer observed in the majority of cases. The only significant interaction of stress and support occurred for between-person effects in relation to self-esteem. In this instance, higher levels of perceived support were associated with a weakened association between stress and self-esteem.

Despite the significant findings, results from Model I should be interpreted with caution. It cannot be determined whether significant results using this model are due to stable characteristics of the person or changes within persons over time, although studies that employ Model I analyses often discuss findings in more conclusive between-person language. Model II represents a better and more appropriate way in which to examine data from a longitudinal study. Overall, I believe that the results from the Model II analyses represent a more accurate and statistically stable image of the associations among stress, perceived support, and distress. However, conclusions with regard to stress buffering must be tentative given the lack of consistency in the study's findings.

Use of the Cohen and Will's (1985) interaction criterion yielded evidence for stress buffering in relation to self-esteem, but buffering was not observed in relation to depressive symptoms. These findings are also perplexing because measures of depressive symptoms tend to be common in studies of support and buffering. Perhaps the types of stressors

experienced in this context were more likely to tap aspects of self-esteem as opposed to symptoms of depression. It is also possible that more power is needed to detect stress buffering effects for measures of depressive symptoms such as the CES-D. Overall, there are mixed findings of buffering when a stress-by-support interaction is used as an indicator of stress buffering.

To fully investigate this phenomenon it was important to include appraisal as a mediator of the moderating effect that perceived support was proposed to have on the stress/distress relationship. This mediated moderation model was examined with the two adjustment outcome variables (self-esteem and depressive symptoms) that had previously shown stress buffering effects under Model I conditions. In these additional analyses, mediated moderation was expected to be shown through a change in the interactive effect of stress and support on distress depending on the inclusion of appraisal in the model, but these effects were not detected. Even when the more robust Model I conditions were used and more than one type of appraisal was examined, mediated moderation was not found. Changes in the estimates of stress and support were either non-significant or insubstantial.

Despite the lack of consistent buffering effects, the results did show a strong association between appraisal and perceived support regardless of appraisal type, model, or criterion. The nature of this association requires further examination before conclusions of directionality, causality, and generalizability can be made; however, it should be evident that appraisal is an important correlate of stress and support processes that should be given greater attention. Future work should focus on further defining the nature of its relationship to stress and support. Additionally, for self-esteem and challenge appraisals results were suggestive of a within-person appraisal buffering effect that would have gone undetected were it not for the separation of within- and between-person processes. The current study

provides preliminary evidence, but further work should actively pursue “appraisal buffering” as a possible player in the overall stress and coping process.

The results did not present consistent evidence that perceived support buffered the impact of stress on distress, nor did it find that appraisal was the mechanism by which this process operated. These results are similar to those of Pakenham and Rinaldis (2001) who found significant linkages between appraisal and various adjustment outcomes, but no appraisal-by-support interaction in their cross-sectional study of men with HIV/AIDS. One possibility is that other criteria need to be identified to better test these associations. Cohen and Wills (1985) highlighted the interaction of stress and support as the standard by which buffering could be recognized, but perhaps these criteria should be updated to better reflect more advanced statistical software and data analysis techniques as well as to better suit the cross-sectional and correlational nature of the literature. Given the lack of findings in the study it may be worthwhile to consider other possible mechanisms that could be involved in the operation of perceived support in addition to limitations in the study design and implementation that might have diminished the likelihood of detecting buffering or the role of appraisal.

### **Possible Mechanisms of Perceived Support**

Results for the classic stress buffering effect were mixed; however, there was little ambiguity regarding the role of appraisal in these analyses. The mediated moderation model was unsupported such that appraisal had no mediating influence on the association between perceived support and the stress/distress relationship. Many researchers have proposed appraisal as a mechanism of perceived support (Barrera, 1986; Cohen & Wills, 1985; Rodriguez & Cohen, 1998), but the lack of findings here and in other investigations (Pakenham and Rinaldis, 2001) should encourage social support researchers to reconsider

the role of appraisal as well as perceived support in stress management processes.

There are many different types of appraisal, and it could be that only certain types of appraisal are mediators of the buffering process and only when they are employed by particular individuals in specific contexts. In the current study I examined forms of primary and secondary appraisal through challenge and confidence measures. The lack of findings may be due to the way in which appraisal was measured here as both challenge and confidence were assessed using a novel task created specifically for this study. Appraisal has also been conceived of as threat (Hudek-Knezevic and Kardum, 2000; McNett, 1987, Pakenham & Rinaldis, 2001), controllability (Hudek-Knezevic and Kardum, 2000; Pakenham & Rinaldis, 2001; Valentiner, Holahan, and Moos, 1994), and even problem solving ability (Elliott, Herrick, and Witty, 1992). These are more cognitive conceptions, but appraisal also has emotional components such as excitement or worry. It is possible that mediation would be found with one of these alternate forms of appraisal. Thus, I cannot say with certainty that appraisal is not a mechanism of perceived support given that only challenge and confidence were examined in this study.

However, it must be acknowledged that appraisal, while clearly an important social support concept in its own right, may not be the mechanism by which perceived support operates. Research has already linked perceptions of support to personality and social interaction variables such as hostility and social conflict (Gallo & Smith, 1999) and social competence (Sarason, Sarason, Hacker, & Basham, 1985). Perhaps, some aspect of personality or the way in which individual's tend to interact with others is a mechanism of perceived support. Support might alter these factors in a way that influences the experience of stress or distress. Consistent with this possibility is Lakey and Cassidy's (1990) conception of perceived support as a cognitive personality variable that represents well-established

beliefs about one's relationships. Perceived support is proposed to reflect a general sense of relationship satisfaction where feeling positive about the self, partners, and relationships biases perception of and memory for support-related behaviors.

Alternately, perceived support might actually be the mechanism in the operation of some other construct's buffering of the stress-distress relationship. Perceived support is thought of as a stable construct, but the current study has revealed a substantial amount of variability and breaking with this assumption allows for the possibility of perceived support as a mechanism of buffering as opposed to an agent. In fact, perceived support could be a mechanism of appraisal buffering. The relations between these two variables are usually not conceived of in this manner, but given that they have both been traditionally studied with correlational designs, the directionality and causality of their association is open for debate.

Attachment style is another possible buffering agent. Attachment style was discussed earlier as being linked with perceptions of support theoretically (Sarason, Pierce, & Sarason, 1990). Similar to perceived support (Cutrona, Cole, Colangelo, Assouline, & Russell, 1994), better adjustment during the college transition has been associated with secure attachment (Armsden & Greenberg, 1987). Attachment styles serve as an organizing force allowing the individual to sort support-relevant beliefs and behaviors into manageable and meaningful groups (Kobak & Hazan, 1991) and this could include perceptions of support. It could be that attachment style buffers the full impact of stress on distress by altering perceived support (or even appraisal).

Uchino (2009) presents a conceptual framework for the relationship between social support and health in which the early family environment leads to the development of "positive psychosocial profiles" which impact coping and health behaviors that in turn influence one's physical health. The "positive psychosocial profile" is proposed to include

perceived support, personality traits, social skills, self-esteem, and feelings of personal control. Given the interrelations among all of these variables perceived support may not hold a special place in the management of stress but again could simply be an additional mechanism by which some other factor buffers stress.

It is also feasible that there are multiple mechanisms that enable and explain buffering. Regardless of buffering agent (i.e., perceived support, appraisal, attachment, etc.), it seems shortsighted to assume that there is one and only one mechanism that explains the operation of perceived support or the mediation of buffering. This only complicates the design and analysis of future studies, but acknowledging and accounting for this possibility is important if research is to progress.

One final possibility is that support has a more direct influence on physiology. Cohen and Wills (1985) presented two possible paths that might explain how support might reduce the deleterious effects of stress. This study has examined the more indirect cognitive path which suggests appraisal as a mechanism of perceived support. Cohen, in particular, has voraciously examined the alternate physiological path in which support is thought to have a direct preventative influence (Cohen, 2004). It could be that buffering is explained exclusively by this direct path, although research on this topic has yielded a similar set of inconclusive studies that seem to demonstrate “buffering” but fail to establish the how and why of this relationship (Cohen & Janicki-Deverts, 2009).

### **Limitations**

Several limitations of the design may have influenced the findings of the study. First, the number of participants is somewhat small. Only 63 participants completed all four time-points, with a total of 81 participants enrolling in the study initially out of a possible 1,212 total in the incoming class. Such a small sample may not have been representative of the

larger university population or of college students in general. It could be that those who would be more likely to volunteer for a study of this nature are better adjusted than those who did not. Despite great within-person variability in all variables, the distribution of the outcome measures of self-esteem and depressive symptoms does indicate that the sample reported moderate to high levels of self-esteem and moderate to low levels of depressive symptoms. Additionally, the small number of subjects may not have provided enough power for the detection of the effects of interest in the study. A more exacting test of these hypotheses should attempt to include a greater number of participants to ensure that there is enough power to detect the predicted associations.

Students who have more free time and less stress might have been more willing to sign up for a four session survey study relative to those who were busier or more stressed. Another difference might have been interest in Lehigh University or college in general. Students with greater interest or excitement for college might be more likely to participate in a study relating to this transitional period, particularly if they thought it might be helpful to the university. Recruitment letters indicated that the study was about stress and support so students who were having problems in either area or maintained an interest in psychology in general might have been more likely to sign up. Ultimately, the current sample is quite small and there are bound to be differences between those who volunteered and those who did not. Generalization of the findings, even to the larger university population, must be made with caution.

Second, increasing the number of data collection time-points would also enhance the ability to detect the relevant associations. While most people are highly responsive to an initial stressor, key differences are often found not in these initial levels of stress but in how quickly a person is able to recover from stress. Adaptability and well-being may be signified

by the maintenance of stable healthy functioning in response to stress or traumatic experiences (Bonanno, 2005). In relation to the current study this implies that additional time-points not bound to a specific stressful period of the semester (e.g., orientation, beginning of classes, midterms, beginning of spring semester) would have provided responses that could have served as a measure of recovery. Such measurement would be difficult given that people are more likely than not experiencing overlapping stressors so defining a period of baseline, stress, and recovery in a naturalistic setting could be difficult. The inclusion of more than four time-points was not feasible for the current study given budget constraints with regard to participant payment as well as a desire to not overburden students during a stressful life period. Despite this limitation the current study provided a much more detailed and elaborate examination of stress relative to the literature which tends to examine stress cross-sectionally or retrospectively. Stress and coping researchers should seriously consider the value of recovery as a way to measure well-being in line with Bonanno's work (2005).

Third, participants were given a three week period in which to complete the assessment for each time-point. This greater flexibility certainly led to increased retention of participants in the study overall, but could have also altered the comparability of student responses. Students completing items closer to key dates (e.g., orientation, the first data of classes, mid-term exams, etc.) may have reported greater levels of stress and distress relative to those who completed the same assessment even one week later (or earlier). For example, Time 3, although predicted to be a highly stressful period during the semester, may have been rated as more or less stressful depending on how close or far students were to having stressful benchmarks (e.g., finishing mid-terms vs. beginning preparation for finals). The fact that session was not a useful proxy for stress suggests that this is likely the case. This is the

most problematic of the three limitations discussed above, but again seemed to be a necessary evil for the retention of participants in the study as a whole.

Fourth, measures, particularly the novel measures created for the study, may not have been sensitive enough to detect changes over time, particularly for the buffering analyses. The novel measures of appraisal may not have contained enough items to fully capture either challenge or confidence appraisal. Additionally, measures of supportiveness by network were worded very generally (e.g., How emotionally/instrumentally/informationally supportive do you find this person in general?) and it is possible that this non-specific wording led to ceiling effects in responses. This idea is supported by the ratings for all three types of support which ranged from “somewhat supportive” to “extremely supportive” on average regardless of support source or type across the four sessions.

A fifth limitation, which relates to this measurement sensitivity issue, is that some measures do not fit exclusively into one construct category (e.g., stress, support, appraisal, distress). For instance, measures of self-esteem and depressive symptoms could potentially be used to represent levels of stress instead of distress, and appraisal measures might fit into the category of support or stress. In particular, some items from the PSS, the measure of stress in the current study, seem to tap appraisal (in the form of controllability and ability to handle stress) as opposed to a more objective estimate of how much “stress” a person has experienced. Given the predictive nature of the models presented above, this crossing of constructs is incredibly problematic. Currently, the PSS is the most widely used measure of stress in the social support literature. It has been shown to be highly reliable and valid, but problems with interpreting it in the current study and in prior work should not be ignored.

This is representative of a larger issue in the social support field which is a general lack of precision and consistency in both the operationalization and measurement of

constructs (Dohrenwend, Dohrenwend, Dodson, & Shrout, 1984). It can be difficult, even impossible at times, to compare and integrate findings given the disparate ways in which stress and support are conceptualized and measured. Part of the problem is that there is such an applied focus that researchers often tailor assessment to specific populations and contexts. Greater efforts should be made to create valid and reliable measures that represent unique constructs that do not cross construct boundaries.

An extension of this limitation is the definition of stress in the transitional context. Stress was measured very generally, and social network measures were viewed as assessments of support. It is likely that changes in both the quality and nature of relationships with support network members at Home and at College in and of themselves served as stressors. Prior work has suggested that this transitional period can be fraught with difficulty and conflict given that old relationships must be re-negotiated and forming new relationship can be risky and intimidating (Schwartz & Buboltz, 2004; Swenson, Nordstrom, & Hiester, 2008). In fact, balancing these two social networks is proposed to be a major challenge of the transitional period. The current measures of social network may not lend themselves well to this alternate stress categorization. The study focused on the quality of the participants' closest support figure from each network, but did not tap into the stress inherent in maintaining the Home network and forming the College network. Measures of broader social integration that assess network quality and quantity specifically as stressors would better address the likelihood that managing social networks is a form of stress in the college transition.

An experimental design would have been helped to further the theoretical knowledge of the Buffering Hypothesis, but examining this process in light of meaningful experiences of stress, support, and distress was paramount. In-lab studies can provide great detail about

exactly how specific processes operate, but if this information cannot be applied to the actual everyday operation of said processes the knowledge gained from such studies is hollow. Current in-lab manipulations of stress and support do not adequately parallel the experience of these same constructs in response to real world events. However, field experiments and quasi-experiment may be an appropriate compromise that introduces elements of control while still examining stress and support processes that occur naturally. The limitations of the study are not trivial, but neither are its contributions to the field in spite of them.

### **Conclusion**

Notwithstanding these limitations, the current study has made substantial contributions to the understanding of the challenges faced by students in their transition from high school to college. Both the intensity and stability of stress, perceived support, and distress were examined as well as the quality of student support networks. The current study also represents a meticulous examination of the Buffering Hypothesis which was not ultimately supported even though several forms of distress and appraisal, statistical analyses, and buffering criteria were employed to do so. A reconsideration of the Buffering Hypothesis is warranted, in conjunction with research that addresses the limitations set forth in the previous section. Future work should focus on addressing causality with regard to social support processes through experimental designs, while also concurrently continuing to examine these processes in settings where knowledge can be applied to benefit people in navigating stress, managing distress, and utilizing support.

## References

- Ainsworth, M.D.S. (1979). Infant-mother attachment. *American Psychologist*, 34, 932-937.
- Alipuria, A. K. (2007). First-year college student decision making: How freshmen respond to the stress of the college transition. *Dissertation Abstract International*, 69(1). (UMI No. AAT 3299567) Retrieved March 25, 2011, from Dissertations and Theses database.
- Armsden, G.C., & Greenberg, M.T. (1987). The inventory of parent and peer attachment: Individual differences and their relationship to psychological well-being in adolescence. *Journal of Youth and Adolescence*, 16, 427-454.
- Barrera, M., Jr. (1981). Social support in the adjustment of pregnant adolescents: Assessment Issues. In B.H. Gottlieb (Ed.), *Social Networks and Social Support*. (pp.69-96). Beverly Hills: Sage.
- Barrera, M., Jr. (1986). Distinctions between social support concepts, measures, and models. *American Journal of Community Psychology*, 14, 413-445.
- Bean, J.P. (1985). Interaction effects based on class level in an explanatory model of college student dropout syndrome. *American Educational Research Journal*, 22, 35-64.
- Bolger, N., & Amarel, D. (2007). Effects of social support visibility on adjustment to stress: Experimental evidence. *Journal of Personality and Social Psychology*, 92, 458-475.
- Bonanno, George, A. (2005). Resilience in the Face of Potential Trauma. *Current Directions in Psychological Science*, 14, 135-138.
- Bowlby, J. (1973). *Attachment and Loss, Volume 2: Separation*. New York, NY: Basic Books.
- Brooks, J.H., & Dubois, D.L. (1995). Individual and environmental predictors of adjustment during the first year of college. *Journal of College Student Development*, 36, 347-360.
- Bryk, A. S., & Raudenbush, S.W. (1987). Applications of hierarchical linear models to assessing change. *Psychological Bulletin*, 101, 147-158.
- Bryk, A. S., & Weisberg, H. I. (1977). Use of the nonequivalent control group design when

- subjects are growing. *Psychological Bulletin*, 84, 950-962.
- Cheng, S.T., & Chan, A.C. (2005). The Center for Epidemiologic Studies Depression Scale in older Chinese: thresholds for long and short forms. *International Journal Geriatric Psychiatry*, 5, 465-70.
- Cobb, S. (1976). Social support as a moderator of life stress. *Psychosomatic Medicine*, 38, 300-314.
- Cochrane, R., & Robertson, A. (1973). The Life Events Inventory: A measure of the relative severity of psychological stressors. *Journal of Psychosomatic Research*, 17, 135-139.
- Cohen, S. (2004). Social relationships and health. *American Psychologist*, 59, 676-684.
- Cohen, S., Doyle, W.J., Skoner, D.P., Rabin, B.S., & Gwaltney, J.M. (1997). Social ties and the susceptibility to the common cold. *Journal of the American Medical Association*, 277, 1940-1944.
- Cohen, S., Doyle, W.J., Turner, R., Alper, C.M., & Skoner, D.P. (2003). Sociability and susceptibility to the common cold. *Psychological Science*, 14, 389-395.
- Cohen, S., & Hoberman, H.M. (1983). Positive events and social supports as buffers of life change stress. *Journal of Applied Social Psychology*, 13, 99-125.
- Cohen, S., & Janicki-Deverts, D. (2009). Can we improve our physical health by altering our social networks. *Perspectives on Psychological Science*, 4, 375-378.
- Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, 24, 385-396.
- Cohen, S., Mermelstein, R., Kamarck, T., Hoberman, H. (1985). Measuring the functional components of social support. *Social Support: Theory, Research, and Application*, 24, 73-94.
- Cohen, S., & Wills, T. A. (1985). Stress, social support, and the buffering hypothesis. *Psychological Bulletin*, 98, 310-357.
- Cutrona, C. E. (1984). Social support and stress in the transition to parenthood. *Journal of Abnormal Psychology*, 93, 378-390.

- Cutrona, C.E., Cole, V., Colangelo, N., Assouline, S.G., & Russell, D.W. (1994). Perceived parental support and academic achievement: An attachment theory perspective. *Journal of Personality and Social Psychology, 66*, 369-378.
- Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. *Advances in Personal Relationships, 1*, 37-67.
- Dohrenwend, B.S., Dohrenwend, B.P., Dodson, M. & Shrout, P.E. (1984). Symptoms, Hassles, Social Supports, and Life Events: Problem of Confounded Measures. *Journal of Abnormal Psychology, 93*, 222-230.
- Elliott, T.R., Herrick, S.M., & Witty, T.E. (1992). Problem-solving appraisal and the effects of social support among college students and persons with physical disabilities. *Journal of Counseling Psychology, 2*, 219-226.
- Enders, C.K., & Tofighi, D. (2007). Centering predictor variables in cross-sectional multilevel models: A new look at an old issue. *Psychological Methods, 12*, 121-138.
- Feldman, P. & Cohen, S. (2000). Social support. In A. E. Kazdin (Ed.), *Encyclopedia of Psychology*. New York: Oxford University Press.
- Feldman, S. I., Downey, G., & Schaffer-Neitz, R. (1999). Pain, negative mood, and perceived support in chronic pain patients: A daily diary study of people with reflex sympathetic dystrophy syndrome. *Journal of Consulting and Clinical Psychology, 67*, 776-785.
- Fleming, R., Baum, A., Gisriel, M. M., & Gatchel, R. J. (1982). Mediating influences of social support on stress at three mile island. *Journal of Human Stress, 8*, 14-22.
- Freeman, P., & Rees, T. (2010). Perceived social support from team-mates: Direct and stress-buffering effects on self-confidence. *European Journal of Sports Science, 10*, 59-67.
- Friedlander, L.J., Reid, G.J., Shupak, N., & Cribbie, R. (2007). Social support, self-esteem, and stress as predictors of adjustment to university among first-year undergraduates. *Journal of College Student Development, 48*, 259-274.
- Frydman, M. I. (1981). Social support, life events and psychiatric symptoms: A study of direct, conditional and interaction effects. *Social Psychiatry, 16*, 69-78.

- Gallo, L.C., & Smith, T.W. (1999). Patterns of hostility and social support: Conceptualizing psychosocial risk factors as characteristics of the person and the environment, *Journal of Research in Personality*, *33*, 281-310.
- Gidron, Y., & Nyklicek, I. (2009). Experimentally testing Taylor's stress, coping, and adaptation framework. *Anxiety, Stress, & Coping*, *22*, 525-535.
- Henderson, S. (1981). Social relationships, adversity and neurosis: An analysis of prospective observations. *British Journal of Psychiatry*, *138*, 391-398.
- Henderson, S., Byrne, D. G., Duncan-Jones, P., Scott, R., & Adcock, S. (1980). Social relationships, adversity and neurosis: A study of associations in a general population sample. *British Journal of Psychiatry*, *136*, 354-583.
- Howell, D.C. (2007). *Statistical Methods for Psychology*. Belmont, Canada: Wadsworth Cengage Learning.
- Hudek-Knezevic, J., & Kardum, I. (2000). The effects of dispositional and situational coping, perceived social support, and cognitive appraisal on immediate outcome. *European Journal of Psychological Assessment*, *16*, 190-201.
- Kaul, M., & Lakey, B. (2003). Where is the support in perceived support? The role of generic relationship satisfaction and enacted support in perceived support's relation to low distress. *Journal of Social and Clinical Psychology*, *22*, 59-78.
- Kennell, J., Klaus, M., McGrath, S., Robertson, S., & Hinkley, C. (1991). Continuous emotional support during labor in a U.S. hospital: A randomized controlled trial. *Journal of the American Medical Association*, *265*, 2197-2201.
- Kenny, M.E. (1987). The extent and function of parental attachment among first-year college students. *Journal of Youth and Adolescence*, *16*, 17-29.
- Kobak, R.R., & Hazan, C. (1991). Attachment in marriage: Effects of security and accuracy of working models. *Journal of Personality and Social Psychology*, *60*, 861-869.
- Kulik, J.A., & Mahler, H.I.M. (1989). Social support and recovery from surgery. *Health Psychology*, *8*, 221-238.

- Lakey, B., & Cassady, P.B. (1990). Cognitive processes in perceived social support. *Journal of Personality and Social Psychology, 59*, 337-343.
- Lakey, B., & Drew J.B. (1997). A social-cognitive perspective on social support. In G.R. Pierce, B. Lakey, I.G. Sarason, & B.R. Sarason (Eds.) *Sourcebook of Social Support and Personality* (pp.107-140). New York: Plenum Press.
- Lakey, B., Tardiff, T.A., & Drew, J.B. (1994). Negative social interactions: Assessment and relations to social support, cognition, and psychological distress. *Journal of Social and Clinical Psychology, 13*, 42-62.
- Lapsley, D.K., & Edgerton, J. (2002). Separation-individuation, adult attachment style, and college adjustment. *Journal of Counseling and Development, 80*, 484-492.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Lehigh at a glance (2010, December). Students. *Lehigh University: About Lehigh*. Retrieved April 18, 2011, from <http://www4.lehigh.edu/about/glance/students.aspx>
- Malinauskas, R. (2010). The associations among social support, stress, and life satisfaction as perceived by injured college athletes. *Social Behavior and Personality, 38*, 741-752.
- McNett, S.C. (1987). Social support, threat, and coping responses and effectiveness in the functionally disabled. *Nursing Research, 36*, 98-103.
- Miller, P. M., & Ingham, J. G. (1979). Reflections on the life events to illness link with some preliminary findings. In I. G. Sarason & C. D. Spielberger (Eds.), *Stress and anxiety (ftp.* 313-336). New York: Hemisphere.
- Muller, D., Judd, C.M., & Yzerbyt, V.Y. (2005). When moderation is mediated and mediation is moderated. *Journal of Personality and Social Psychology, 89*, 852-863.
- Orth-Gomer, K., Rosengren, A., & Wilhelmsen, L. (1993). Lack of social support and incidence of coronary heart disease in middle-ages Swedish men. *Psychosomatic Medicine, 55*, 37-43.
- Pakenham, K.I., & Rinaldis, M. (2001). The role of illness, resources, appraisals, and coping strategies in adjustment to HIV/AIDS: The direct and buffering effects. *Journal of*

- Behavioral Medicine*, 24, 259-279.
- Paykel, E. S., Emms, E. M., Fletcher, J., & Rassaby, E. S. (1980). Life events and social support in puerperal depression. *British Journal of Psychology*, 136, 339-346.
- Pierce, G.R., Sarason, B.R., & Sarason, I.G. (Eds.) (1996). *The handbook of social support and the family*. New York: Plenum.
- Power, M.J. (1988). Stress-buffering effects of social support: A longitudinal study. *Motivation and Emotion*, 12, 197-204.
- Power, M.J., Champion, L.A., & Aris, S.J. (1988). The development of a measure of social support: The Significant Other (SOS) Scale. *British Journal of Clinical Psychology*, 27, 349-358.
- Radloff, L.S. (1977). The CES-D Scale: A self report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.
- Raudenbush, S.W., & Bryk, A.S. (2002). *Hierarchical Linear Models: Applications and Data Analysis Methods*, Second Edition. Thousand Oaks: Sage Publications.
- Rodriguez, M.S., & Cohen, S. (1998). Social Support. *Encyclopedia of Mental Health*, 3, 535-544.
- Rogosa, D.R., Brand, D., & Zimowski, M. (1982). A growth curve approach to the measurement of change. *Psychological Bulletin*, 90, 726-748.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, NJ: Princeton University Press.
- Russell, D.W., Altmaier, E., Van Velzen, D. (1987). Job-related stress, social support, and burnout among classroom teachers. *Journal of Applied Psychology*, 72, 269-274.
- Sandler, I.N., & Barrera, M. (1984). Toward a multimethod approach to assessing the effects of social support. *American Journal of Community Psychology*, 12, 37-52.
- Sarason, I.G., Pierce, G.R., & Sarason, B.R. (1990). Social support and interactional processes: A triadic hypothesis. *Journal of Social and Personal Relationships*, 7, 495-506.

- Sarason, B.R., Sarason, I.G., Hacker, T.A., and Basham, R.B. (1985). Concomitants of social support: Social skills, physical attractiveness, and gender. *Journal of Personality and Social Psychology*, *49*, 469-480.
- SAS Institute Inc. (2010). SAS/STAT® 9.22 user's guide. Cary, NC: SAS Institute Inc.
- Schwartz, J.P., & Buboltz, W.C. (2004). The relationship between attachment to parents and psychological separation in college students. *Journal of College Student Development*, *45*, 566-577.
- Swenson, L.M., Nordstrom, A., & Hiester, M. (2008). The role of peer relationships in adjustment to college. *Journal of College Student Development*, *49*, 551-567.
- Szulecka, T.K., Springett, N.R., and DePauw, K.W. (1987). General health, psychiatric vulnerability and withdrawal from university in first-year undergraduates. *British Journal of Guidance & Counseling*, *15*, 82-91.
- Tao, S., Dong, Q., Pratt, M.W., Hunsberger, B., & Pancer, S.M. (2000). Social support: Relations to coping and adjustment during the transition to university in the People's Republic of China. *Journal of Adolescent Research*, *15*, 123-144.
- Thoits, P.A. (1986). Social support as coping assistance. *Journal of Consulting and Clinical Psychology*, *54*, 416-423.
- Uchino, B.N. (2009). Understanding the links between social support and physical health: A life-span perspective with emphasis on the separability of perceived and received support. *Perspectives on Psychological Science*, *4*, 236-255.
- U.S. Department of Education, National Center for Education Statistics. (2010). *The Condition of Education 2010* (NCES 2010-028), Indicator 21.
- Valentiner, D.P., Holahan, C.J., Moos, R.H. (1994). Social support, appraisals of event controllability, and coping: An integrative model. *Journal of Personality and Social Psychology*, *66*, 1094-1102.
- Wethington, E. & Kessler, R.C. (1986). Perceived support, received support, and adjustment to stressful life events. *Journal of Health and Social Behavior*, *27*, 78-89.

- Wilcox, B. L. (1981). Social support, life stress, and psychological adjustment: A test of the buffering hypothesis. *American Journal of Community Psychology, 9*, 371-386.
- Yazedijan, A., Toews, M.L., Sevin, T., & Purswell, K.E. (2008). "It's a whole new world": A qualitative exploration of college students' definitions of and strategies for college success. *Journal of College Student Development, 49*, 141-154.
- Zhou, E.S., Penedo, F.J., Lewis, J.E., Rasheed, M., Traeger, L. Lechner, S., Soloway, M., Kava, B.R., & Antoni, M.H. (2010). Perceived stress mediates the effects of social support on health-related quality of life among men treated for localized prostate cancer. *Journal of Psychosomatic Research, 69*, 587-590.

Table 1

*Demographic Information Collected at Time 1*

Class	Category	%	Class	Category	%
Gender	Female	58%	Alumni	Father attended	4%
	Male	41%		Mother attended	1%
Age	16	1%		Sibling attended	5%
	17	6%		Relative attended	11%
	18	63%	Contact	Added as friend on	87%
	19	3%		Contact on Facebook	76%
	20	1%		E-mail	38%
Race	White	73%		Phone or Text	41%
	East Asian/Pacific Islander	13%		Spent time with	66%
	Other Asian	10%	Visited Campus	15%	
	Latino	8%	Pre-Orientation	42%	
	American Indian	3%	College Courses	38%	
	Black	1%	Social Network	Friend has attended	43%
Parents	Married	70%		Friend will attend	33%
	Divorced	13%		Partner has/will attend	3%
	Never Married	6%			
	One Deceased	5%			
	Separated	4%			
	Both Deceased	1%			
Birth Order	Only Child	13%			
	1st	39%			
	2nd	32%			
	3rd	10%			
	4th	5%			
Siblings	None	13%			
	One	44%			
	Two	27%			
	Three	10%			
	Four	3%			
	Six +	3%			

Table 2

Reliabilities (Raw Alphas) for All Measures

<b>Measure</b>	<b>T1</b>	<b>T2</b>	<b>T3</b>	<b>T4</b>
CESD	.77	.88	.91	.85
RSE	.89	.90	.93	.91
PSS	.90	.89	.90	.91
SPS	.91	.94	.94	.95
ISEL Tangible	.62	.74	.73	.73
ISEL Belongingness	.76	.78	.83	.80
ISEL Appraisal	.87	.87	.89	.80
ISEL overall	.88	.91	.92	.90
Support Composite	.94	.96	.96	.95
Challenge Appraisal	.66	.70	.75	.77
Confidence Appraisal	.74	.81	.72	.78

Table 3

*Variability for Normative Change Analyses*

Measure	Total $\sigma$	Stable Individual Differences	Remaining $\sigma$	Normative Change
PSS	50.20	31.49 (62.7%)	18.74 (37.3%)	-.04 (.1%)
ISEL	49.22	40.07 (81.4%)	9.89 (20.1%)	-.74 (1.5%)
SPS	127.48	89.30 (70.1%)	40.88 (32.1%)	-2.70 (2.1%)
Challenge	25.91	16.26 (62.7%)	9.23 (35.6%)	.42 (1.6%)
Confidence	.32	.16 (50.3%)	.16 (50.1%)	-.0014 (-.04)
RSE	29.37	20.60 (70.2%)	8.64 (29.4%)	.12 (.4%)
CESD	36.93	22.99 (62.2%)	12.44 (33.7%)	1.51 (4.1%)

Table 4

*Variability for Support provision and Relationship Quality of Support Networks*

Home	Total $\sigma$	Stable Individual Differences	Remaining $\sigma$	Normative Change
Emotional	.52	.27 (52.7%)	.0003 (.1%)	.25 (47.2%)
Instrumental	.95	.46 (48.8%)	.0368 (3.9%)	.45 (47.3%)
Informational	.72	.38 (52.6%)	.0083 (1.2%)	.33 (46.2%)
Time	1.97	.55 (28.1%)	.40 (20.2%)	1.02 (51.6%)
Communication	.56	.23 (40.3%)	-.0037 (-.7%)	.34 (60.3%)
Positivity	.41	.18 (44.3%)	.005 (1.3%)	.22 (54.4%)
College	Total $\sigma$	Stable Individual Differences	Remaining $\sigma$	Normative Change
Emotional	.96	.50 (51.7%)	-.009 (-.9%)	.47 (49.2%)
Instrumental	1.06	.64 (60.5%)	.02 (2.3%)	.40 (37.2%)
Informational	29.37	20.60 (70.2%)	8.64 (29.4%)	.12 (.4%)
Time	.45	.16 (35.3%)	-.005 (-1.2%)	.29 (65.9%)
Communication	.43	.15 (35.5%)	-.01 (-2.5%)	.29 (66.9%)
Positivity	.54	.27 (50.4%)	-.004 (-.8%)	.27 (50.4%)

Table 5

*Model I: Stress Buffering via Challenge Appraisal for the CES-D*

Models	Effect	Estimate	Error	DF	<i>t</i> value	<i>p</i> value
CESD=Stress   Support						
	Intercept	8.47	.32	75	26.87	<.0001
	Stress	.41	.04	67	9.24	<.0001
	Support	-3.81	.62	62	-6.19	<.0001
	Stress*Support	-.21	.07	55	-3.24	.002
Challenge=Support						
	Intercept	26.49	.42	76	62.67	<.0001
	Support	3.90	.67	68	5.80	<.0001
CESD=Stress   Challenge						
	Intercept	8.44	.33	75	25.76	<.0001
	Stress	.47	.05	67	9.35	<.0001
	Challenge	-.16	.06	62	-2.43	.02
	Stress*Challenge	-.02	.007	55	-2.32	.02
CESD=Stress   Support Stress   Challenge						
	Intercept	8.51	.32	75	26.66	<.0001
	Stress	.41	.05	67	8.88	<.0001
	Support	-3.79	.63	62	-5.97	<.0001
	Stress*Support	-.23	.08	53	-2.88	.006
	Challenge	-.02	.06	53	-.29	.77
	Stress*Challenge	.004	.008	53	.47	.64

Table 6

*Model II: Stress Buffering via Challenge Appraisal for the CES-D*

Model II	Effect	Estimate	Error	DF	<i>t</i> value	<i>p</i> value
CESD=Stress   Support						
	Intercept	8.57	.33	74	25.89	<.0001
	Stress (within)	.28	.06	65	5.03	<.0001
	Support (within)	-5.38	1.00	62	-5.37	<.0001
	Stress*Support (within)	-.06	.21	55	-.26	.80
	Stress (between)	.61	.06	55	10.63	<.0001
	Support (between)	-2.57	.88	55	-2.91	.01
	Stress*Support (between)	-.09	.10	55	-.88	.38
Challenge=Support						
	Intercept	26.36	.42	76	62.26	<.0001
	Support (within)	3.57	.90	67	3.99	.0002
	Support (between)	4.79	.90	122	5.35	<.0001
CESD=Stress   Challenge						
	Intercept	8.47	.37	74	23.14	<.0001
	Stress (within)	.32	.06	65	5.32	<.0001
	Challenge (within)	-.15	.09	62	-1.68	.10
	Stress*Challenge (within)	-.03	.02	55	-1.38	.17
	Stress (between)	.65	.06	55	10.08	<.0001
	Challenge (between)	-.13	.09	55	-1.45	.15
	Stress*Challenge (between)	-.01	.01	55	-1.23	.22
CESD=Stress   Support Stress   Challenge						
	Intercept	8.64	.35	65	24.34	<.0001
	Stress (within)	.28	.06	62	4.87	<.0001
	Support (within)	-5.38	1.03	53	-5.22	<.0001
	Stress*Support (within)	-.03	.24	53	-.13	.90
	Challenge (within)	-.002	.08	53	-.02	.98
	Stress*Challenge (within)	-.005	.02	53	-.23	.82
	Stress (between)	.59	.06	53	9.13	<.0001
	Support (between)	-2.45	.93	53	-2.63	.01
	Stress*Support (between)	-.12	.12	53	-1.03	.31
	Challenge (between)	-.06	.09	53	-.65	.52
	Stress*Challenge (between)	.008	.01	53	.60	.55

Table 7

*Model I: Stress Buffering via Challenge Appraisal for the RSE*

Model I	Effect	Estimate	Error	DF	t value	p value
RSE=Stress   Support						
	Intercept	22.12	.42	75	52.66	<.0001
	Stress	-.21	.04	67	-4.87	<.0001
	Support	3.77	.68	63	5.55	<.0001
	Stress*Support	.13	.07	56	1.93	.06
Challenge=Support						
	Intercept	26.49	.42	76	63.67	<.0001
	Support	3.90	.67	68	5.80	<.0001
RSE=Stress   Challenge						
	Intercept	22.05	.40	75	55.53	<.0001
	Stress	-.21	.04	67	-4.99	<.0001
	Challenge	.33	.07	63	4.75	<.0001
	Stress*Challenge	.01	.007	56	2.10	.04
RSE=Stress   Support Stress   Challenge						
	Intercept	22.08	.38	75	57.85	<.0001
	Stress	-.17	.05	67	-3.74	.0004
	Support	3.18	.67	63	4.78	<.0001
	Stress*Support	.002	.08	54	.02	.98
	Challenge	.24	.06	54	4.30	<.0001
	Stress*Challenge	.01	.007	54	1.56	.12

Table 8

*Model II: Stress Buffering via Challenge Appraisal for the RSE*

Model II	Effect	Estimate	Error	DF	<i>t</i> value	<i>p</i> value
RSE=Stress   Support						
	Intercept	21.77	.40	74	54.90	<.0001
	Stress (within)	-.13	.05	65	-2.48	.02
	Support (within)	3.35	.99	63	3.37	.001
	Stress*Support (within)	.25	.21	56	1.17	.25
	Stress (between)	-.42	.07	56	-6.10	<.0001
	Support (between)	4.60	1.06	56	4.34	<.0001
	Stress*Support (between)	-.25	.12	56	-2.16	.04
Challenge=Support						
	Intercept	22.00	.44	76	49.81	<.0001
	Support (within)	3.96	1.02	66	3.87	.0003
	Support (between)	6.17	.93	121	6.64	<.0001
RSE=Stress   Challenge						
	Intercept	22.14	.39	75	57.34	<.0001
	Stress (within)	-.15	.05	65	-2.96	.0043
	Challenge (within)	.21	.08	63	2.50	.02
	Stress*Challenge (within)	.05	.02	55	3.16	.003
	Stress (between)	-.34	.07	55	-4.94	<.0001
	Challenge (between)	.49	.10	55	5.07	<.0001
	Stress*Challenge (between)	-.001	.01	55	-.10	.92
RSE=Stress   Support Stress   Challenge						
	Intercept	21.80	1.08	74	58.06	<.0001
	Stress (within)	-.10	.26	65	-2.00	.05
	Support (within)	2.83	1.02	63	2.85	.006
	Stress*Support (within)	.02	.21	54	.10	.92
	Challenge (within)	.14	.36	54	2.24	.03
	Stress*Challenge (within)	.05	.09	54	3.00	.004
	Stress (between)	-.29	.18	54	-4.29	<.0001
	Support (between)	3.23	1.08	54	3.28	.002
	Stress*Support (between)	-.29	.12	54	-2.36	.02
	Challenge (between)	.44	.06	54	4.67	<.0001
	Stress*Challenge (between)	.002	.01	54	.16	.88

Table 9

*Model I: Stress Buffering via Confidence Appraisal for the CES-D*

Model I	Effect	Estimate	Error	DF	<i>t</i> value	<i>p</i> value
CESD=Stress   Support						
	Intercept	8.47	.32	75	26.87	<.0001
	Stress	.41	.04	67	9.24	<.0001
	Support	-3.81	.62	62	-6.19	<.0001
	Stress*Support	-.21	.07	55	-3.24	.002
Confidence=Support						
	Intercept	2.78	.05	76	61.00	<.0001
	Support	.36	.08	68	4.52	<.0001
CESD=Stress   Confidence						
	Intercept	8.46	.32	75	26.54	<.0001
	Stress	.51	.05	67	10.53	<.0001
	Confidence	-1.43	.44	61	-3.25	.002
	Stress*Confidence	-.17	.06	55	-2.95	.005
CESD=Stress   Support Stress   Confidence						
	Intercept	8.46	.31	75	26.97	<.0001
	Stress	.40	.05	67	8.92	<.0001
	Support	-3.62	.62	62	-5.82	<.0001
	Stress*Support	-.19	.07	52	-2.73	.009
	Confidence	-.65	.40	52	-1.61	.11
	Stress*Confidence	-.04	.05	52	-.75	.46

Table 10

*Model II: Stress Buffering via Confidence Appraisal for the CES-D*

Model II	Effect	Estimate	Error	DF	<i>t</i> value	<i>p</i> value
CESD=Stress   Support						
	Intercept	8.57	.33	74	25.89	<.0001
	Stress (within)	.28	.06	65	5.03	<.0001
	Support (within)	-5.38	1.00	62	-5.37	<.0001
	Stress*Support (within)	-.06	.21	55	-.26	.80
	Stress (between)	.61	.06	55	10.63	<.0001
	Support (between)	-2.57	.88	55	-2.91	.005
	Stress*Support (between)	-.09	.10	55	-.88	.38
Confidence=Support						
	Intercept	2.78	.05	76	61.79	<.0001
	Support (within)	.23	.13	67	1.74	.09
	Support (between)	.46	.10	121	4.79	<.0001
CESD=Stress   Confidence						
	Intercept	8.51	.35	75	24.10	<.0001
	Stress (within)	.38	.06	65	6.20	<.0001
	Confidence (within)	-.78	.51	61	-1.53	.13
	Stress*Confidence (within)	-.18	.16	54	-1.14	.26
	Stress (between)	.65	.06	54	10.30	<.0001
	Confidence (between)	-1.97	.86	54	-2.28	.03
	Stress*Confidence (between)	-.14	.10	54	-1.35	.18
CESD=Stress   Support Stress   Confidence						
	Intercept	8.52	.36	73	23.98	<.0001
	Stress (within)	.27	.06	65	4.83	<.0001
	Support (within)	-5.30	1.02	62	-5.22	<.0001
	Stress*Support (within)	-.06	.22	51	-.28	.78
	Confidence (within)	-.27	.46	51	-.60	.55
	Stress*Confidence (within)	.03	.15	51	.18	.86
	Stress (between)	.58	.06	51	9.18	<.0001
	Support (between)	-2.14	.97	51	-2.21	.03
	Stress*Support (between)	-.11	.11	51	-1.04	.30
	Confidence (between)	-1.03	.87	51	-1.18	.24
	Stress*Confidence (between)	-.02	.10	51	-.15	.88

Table 11

*Model I: Stress Buffering via Confidence Appraisal for the RSE*

Model I	Effect	Estimate	Error	DF	<i>t</i> value	<i>p</i> value
RSE=Stress   Support						
	Intercept	22.12	.42	75	52.66	<.0001
	Stress	-.21	.04	67	-4.87	<.0001
	Support	3.77	.68	63	5.55	<.0001
	Stress*Support	.13	.07	56	1.93	.06
Confidence=Support						
	Intercept	2.78	.05	76	61.00	<.0001
	Support	.36	.08	68	4.52	<.0001
RSE=Stress   Confidence						
	Intercept	21.99	.44	75	50.43	<.0001
	Stress	-.30	.05	67	-6.42	<.0001
	Confidence	.95	.52	62	1.81	.07
	Stress*Confidence	.07	.06	56	1.20	.24
RSE=Stress   Support Stress   Confidence						
	Intercept	22.09	.42	75	52.69	<.0001
	Stress	-.20	.04	67	-4.59	<.0001
	Support	3.68	.69	63	5.36	<.0001
	Stress*Support	.14	.07	53	1.97	.05
	Confidence	.42	.38	53	1.10	.28
	Stress*Confidence	-.02	.05	53	-.49	.63

Table 12

*Model II: Stress Buffering via Confidence Appraisal for the RSE*

Model II	Effect	Estimate	Error	DF	t value	p value
RSE=Stress   Support						
	Intercept	21.77	.40	74	54.90	<.0001
	Stress (within)	-.13	.05	65	-2.48	.02
	Support (within)	3.35	.99	63	3.37	.001
	Stress*Support (within)	.25	.21	56	1.17	.25
	Stress (between)	-.42	.07	56	-6.10	<.0001
	Support (between)	4.60	1.06	56	4.34	<.0001
	Stress*Support (between)	-.25	.12	56	-2.16	.04
Confidence=Support						
	Intercept	2.78	.05	76	61.79	<.0001
	Support (within)	.23	.13	67	1.74	.09
	Support (between)	.46	.10	121	4.79	<.0001
RSE=Stress   Confidence						
	Intercept	22.47	.40	75	55.58	<.0001
	Stress (within)	-.23	.06	65	-3.86	.0003
	Confidence (within)	.56	.58	62	.97	.34
	Stress*Confidence (within)	.22	.14	55	1.63	.11
	Stress (between)	-.44	.07	55	-6.14	<.0001
	Confidence (between)	3.09	.98	55	3.17	.003
	Stress*Confidence (between)	.27	.12	55	2.28	.03
RSE=Stress   Support Stress   Confidence						
	Intercept	22.07	.41	73	54.21	<.0001
	Stress (within)	-.13	.05	65	-2.51	.01
	Support (within)	3.32	1.00	63	3.31	.002
	Stress*Support (within)	.22	.21	52	1.06	.29
	Confidence (within)	.04	.39	52	.11	.91
	Stress*Confidence (within)	.07	.13	52	.53	.60
	Stress (between)	-.39	.07	52	-5.40	<.0001
	Support (between)	3.72	1.11	52	3.36	.001
	Stress*Support (between)	-.26	.12	52	-2.20	.03
	Confidence (between)	1.91	.98	52	1.96	.06
	Stress*Confidence (between)	.22	.12	52	1.89	.06

Figure 1

**Perceived Support Moderates the Relationship between Stress and Distress**

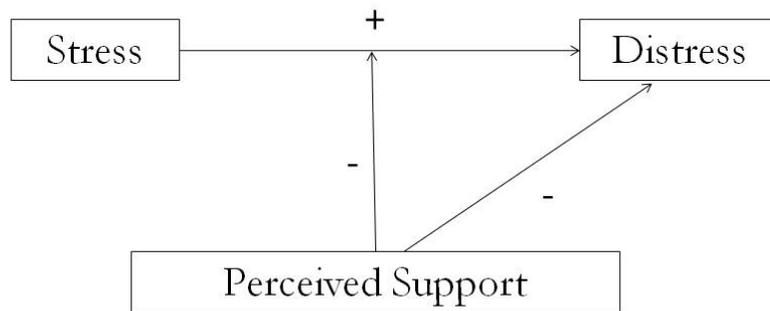


Figure 2

**Mediated Moderation Model Of Stress Buffering**

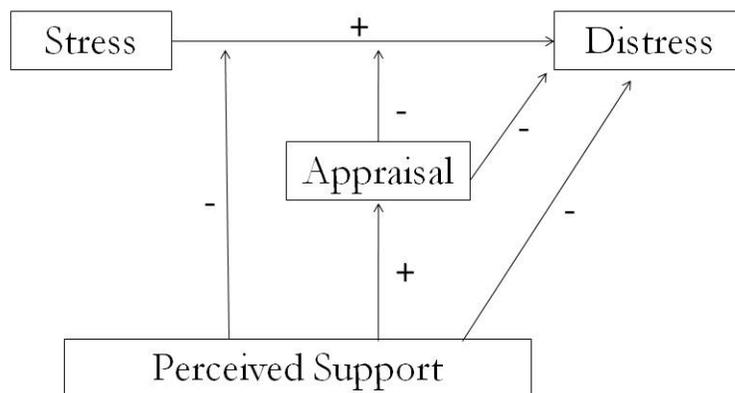


Figure 3

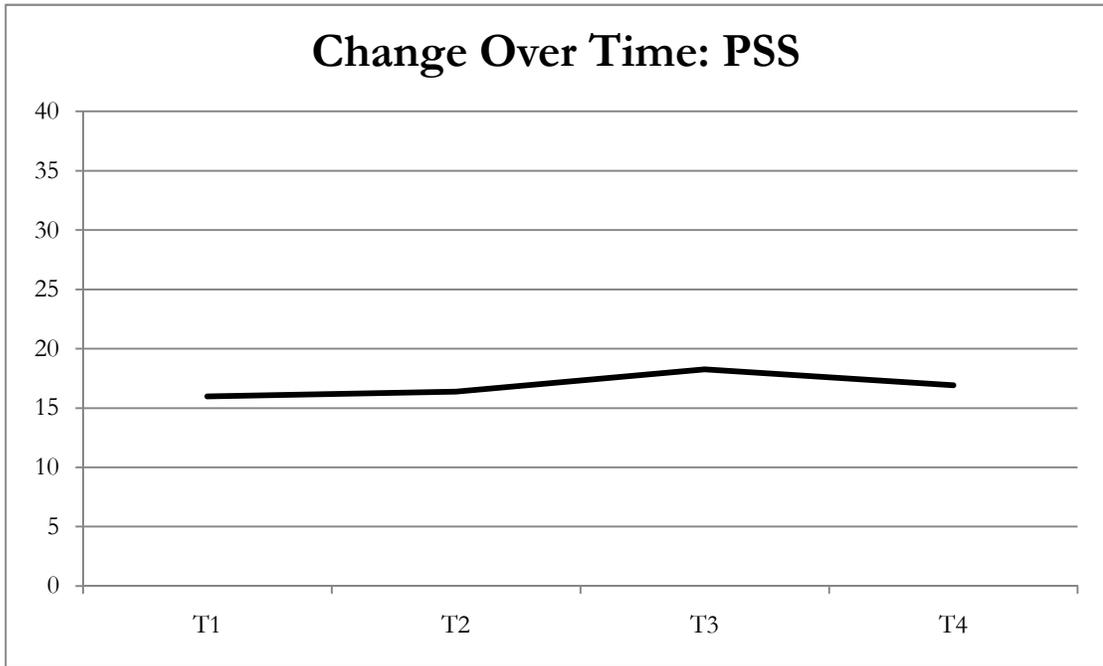


Figure 4

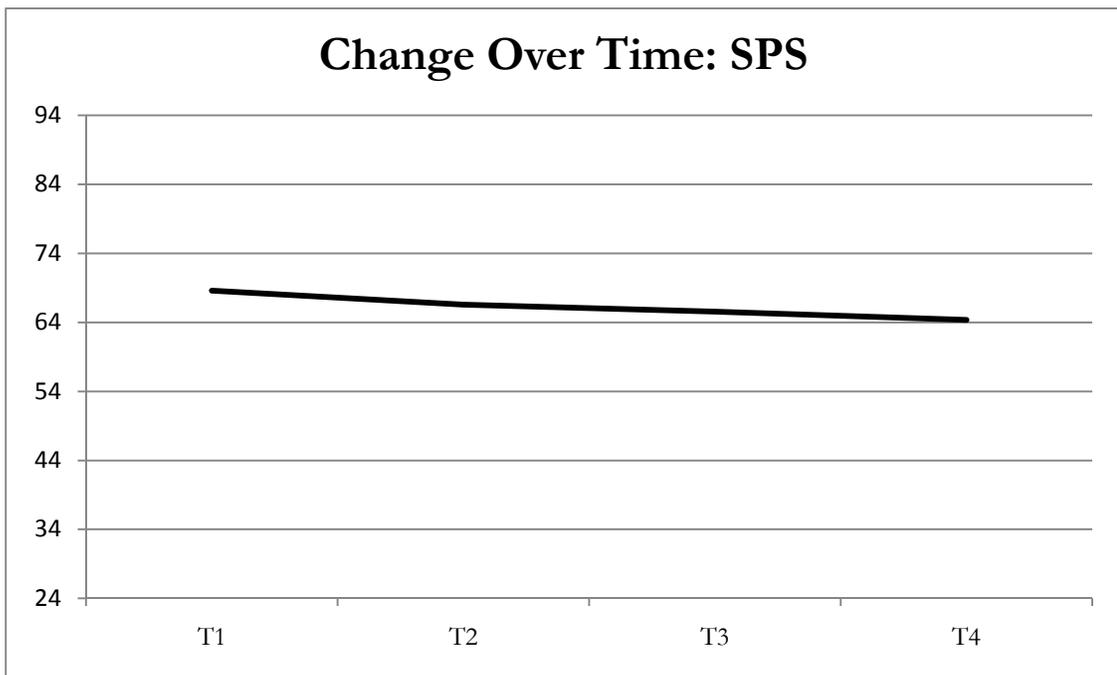


Figure 5

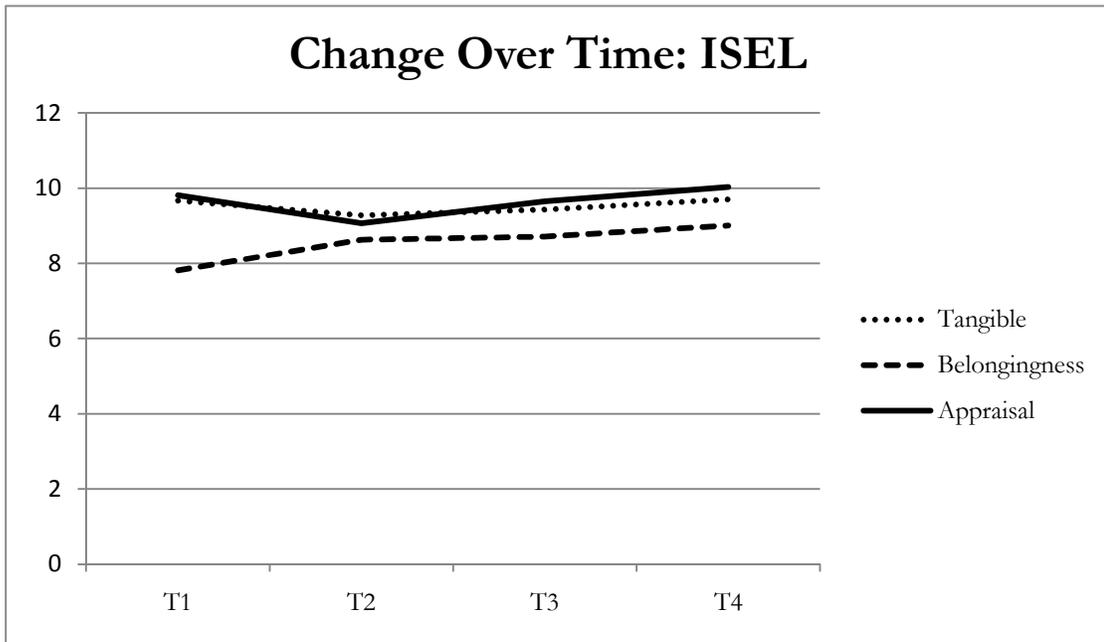


Figure 6

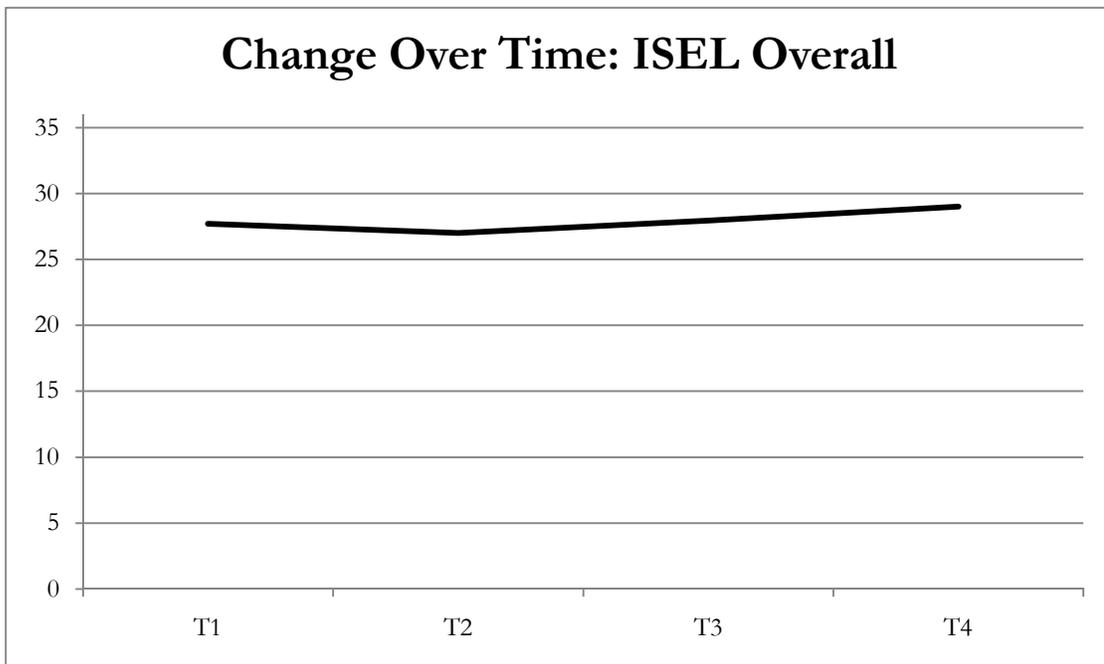


Figure 7

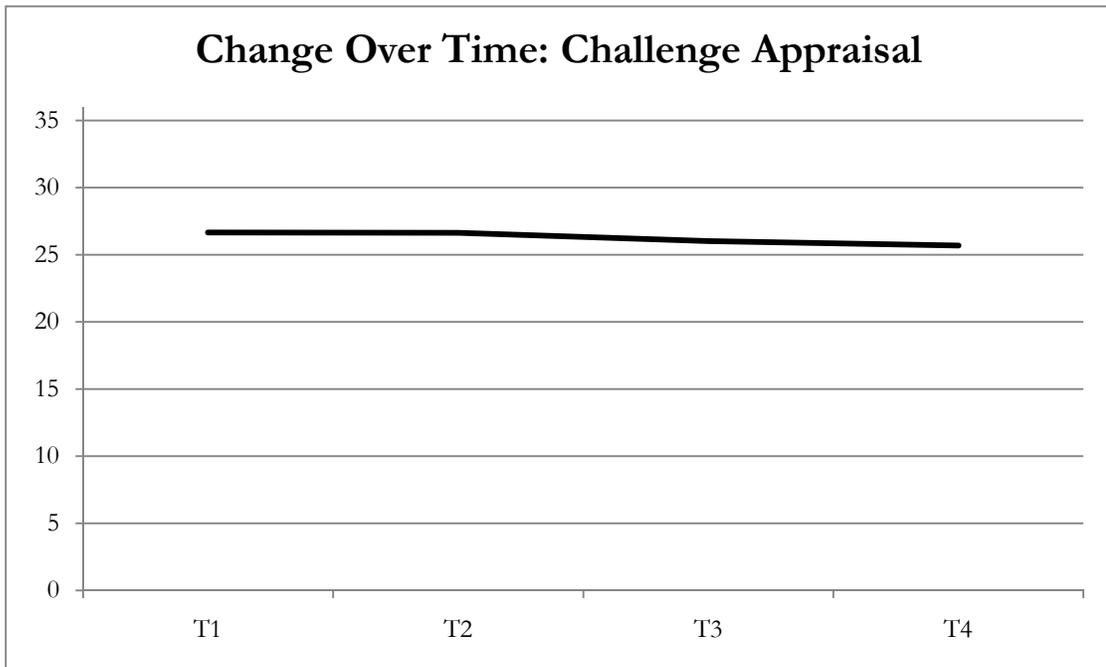


Figure 8

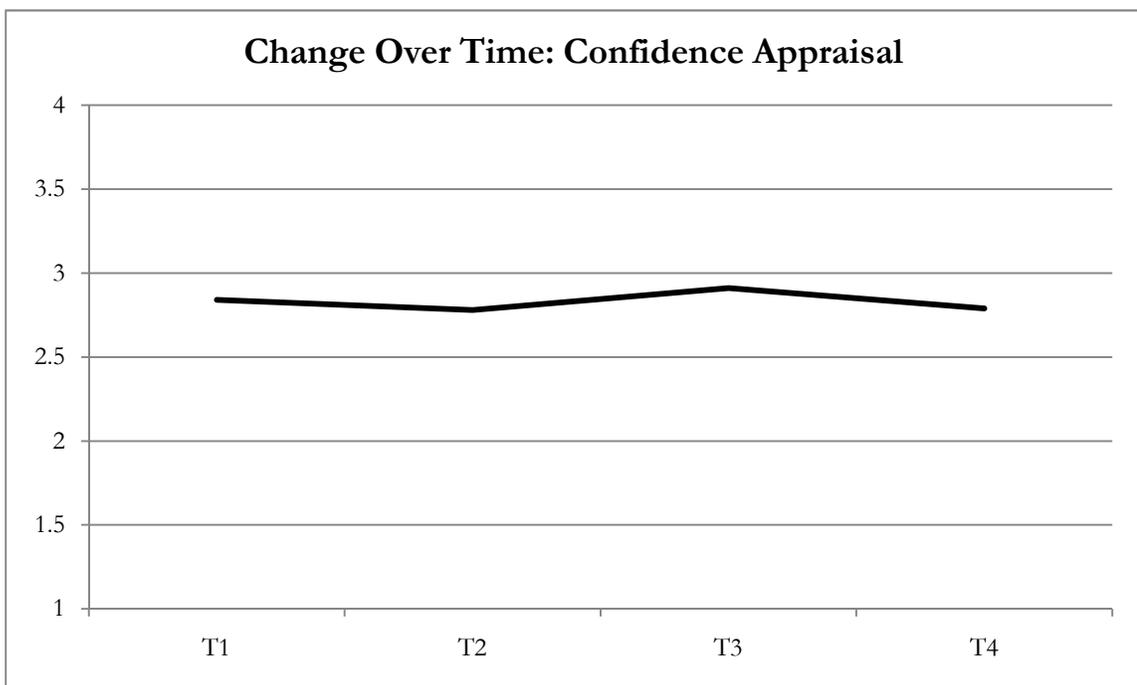


Figure 9

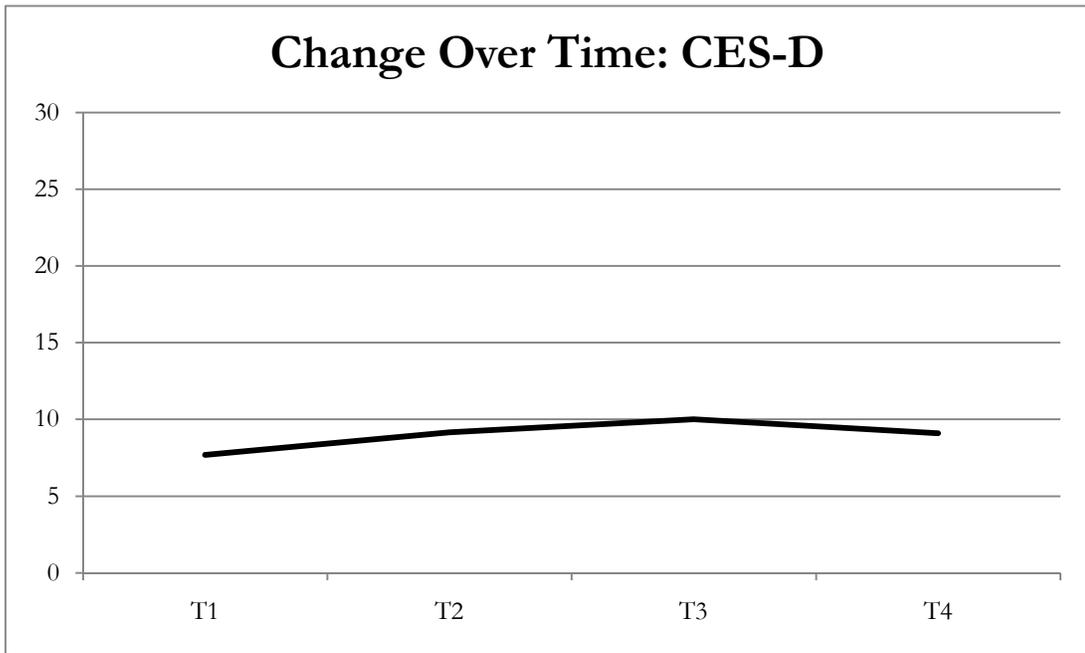


Figure 10

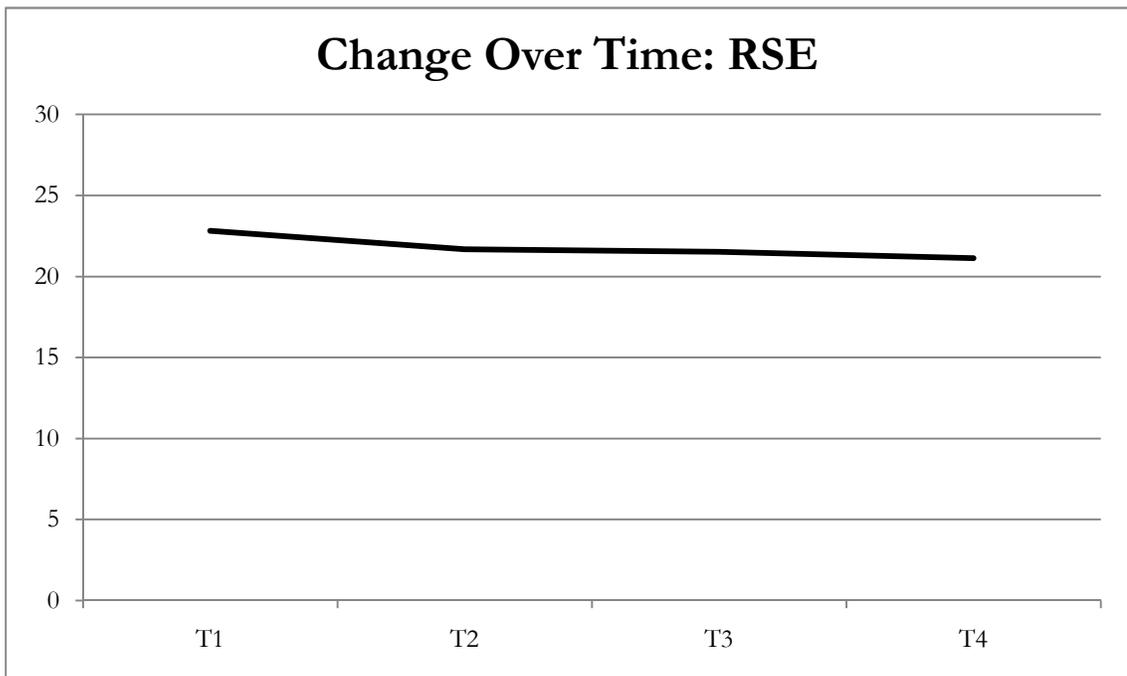


Figure 11

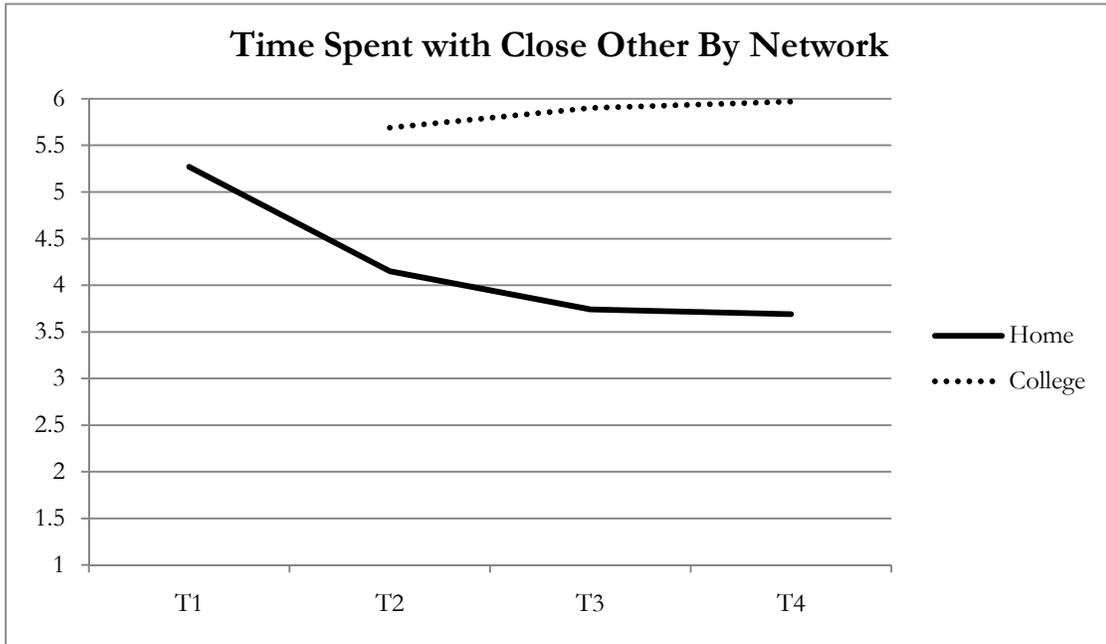


Figure 12

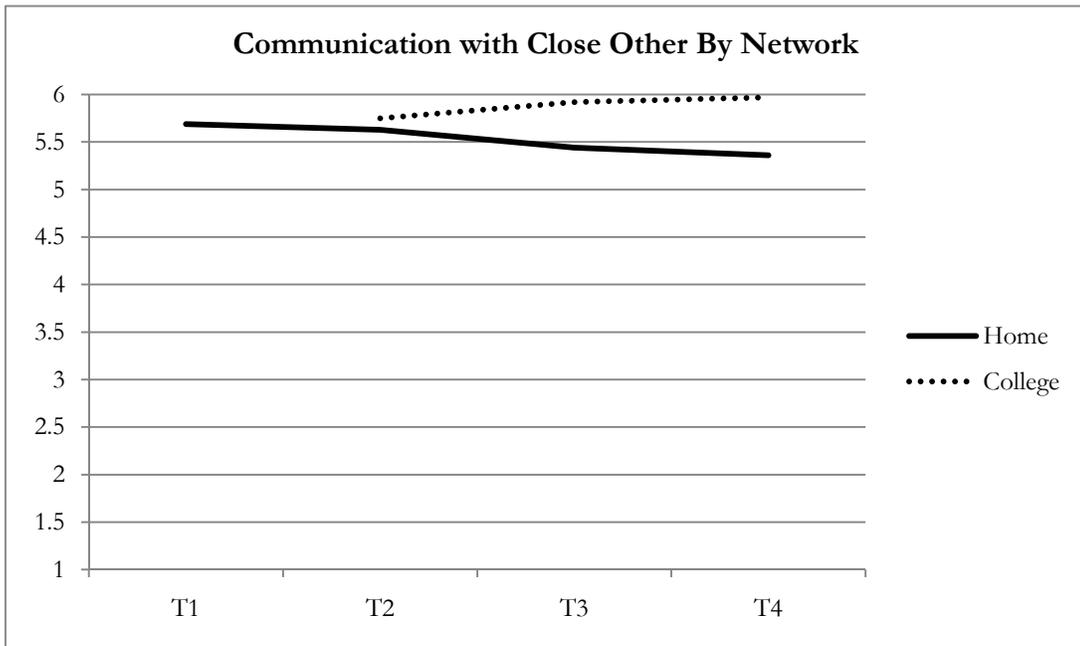


Figure 13

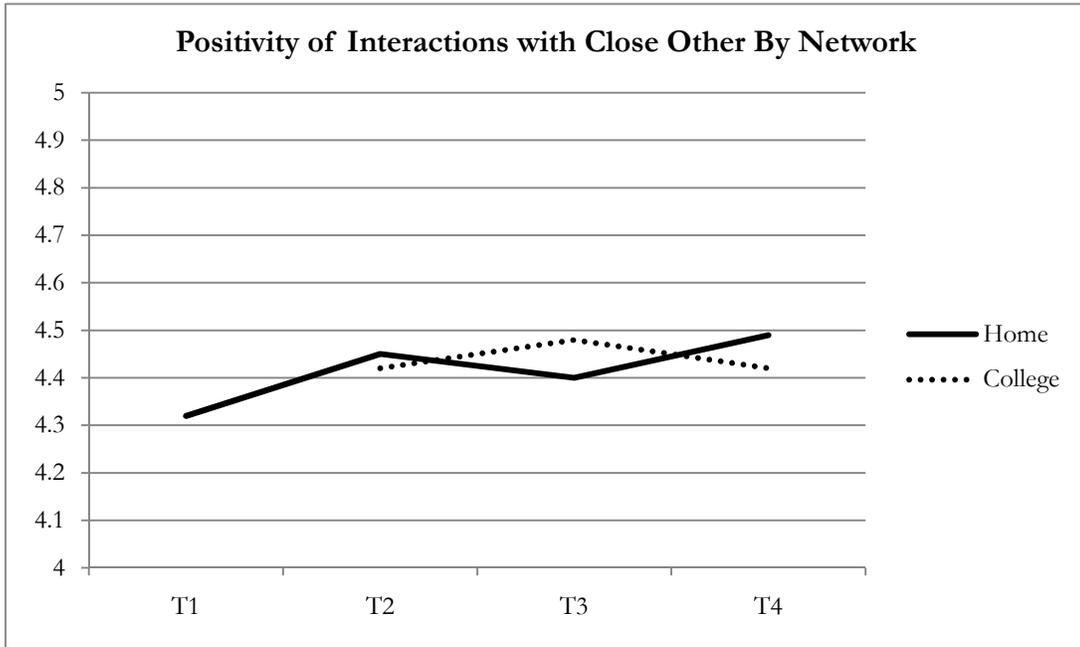


Figure 14

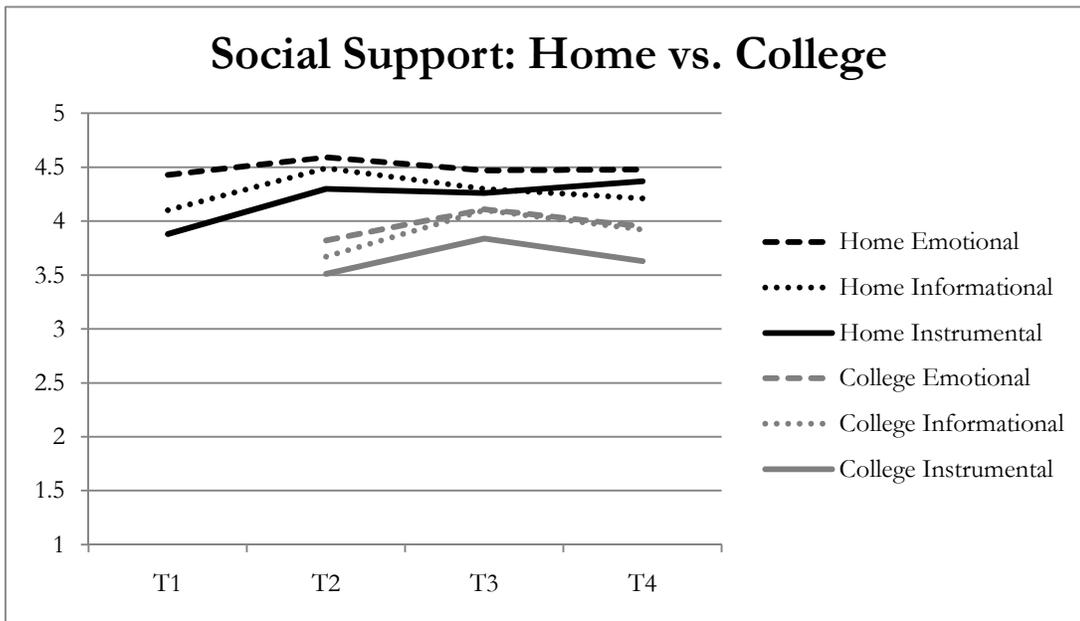
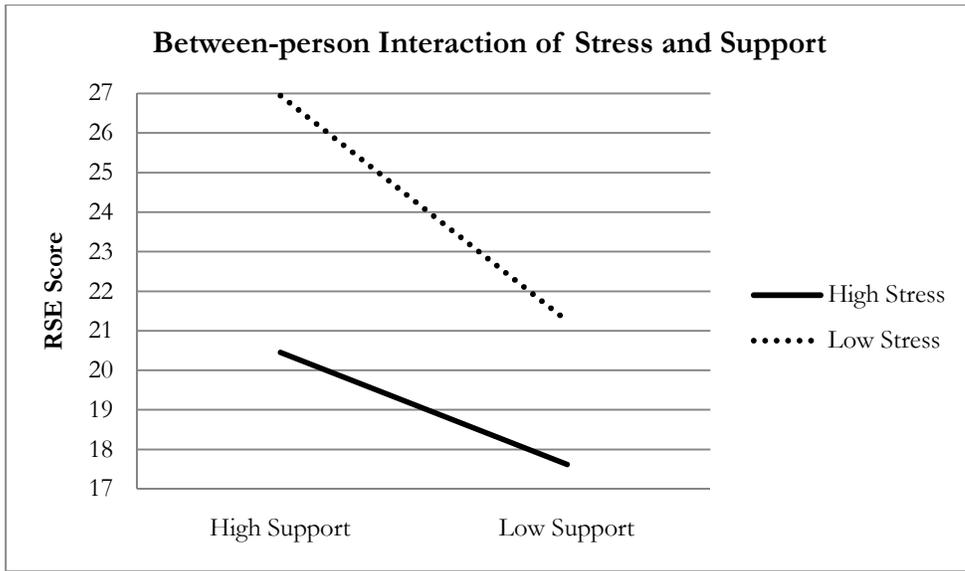


Figure 15



Appendix A

Fall 2010	
Week	Dates
1	8/30 – 9/3
2	9/6 - 9/10
3	9/13 – 9/17
4	9/20 – 9/24
5	9/27 – 10/1
6	10/4 – 10/8
7	10/11 – 10/15
8	10/18 – 10/22
9	10/25 – 10/29
10	11/1 – 11/5
11	11/8 – 11/12
12	11/15 – 11/19
13	11/22 – 11/26
14	11/29 – 12/3
15	12/6 – 12/10

Week	Pre-Or.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Spring
Data Point	T1		T2	T2	T2	T2					T3	T3	T3	T3			T4

## Appendix B

### Demographic Information (T1 only)

- 1) What is your age?
- 2) What is your race or ethnicity? (Please check all that apply)
  - Latino
  - American Indian
  - East Asian or Pacific Islander
  - Other Asian
  - White
  - Black
  - Other (please specify)
- 3) Are your parents:
  - Married
  - Divorced
  - Separated
  - Never Married
  - One parent deceased
  - Both parents deceased
- 4) How many siblings do you have?
- 5) What is your birth order? (e.g., only, first, second, etc.)
- 6) What type of contact have you had with the Lehigh community? (Please select all that apply)
  - I have added friends to facebook who are current or future Lehigh students
  - I have contacted my future roommate(s) on facebook
  - I have contacted my future roommate(s) by e-mail
  - I have contacted my future roommate(s) by phone/text
  - I have spent time with current or future Lehigh students
  - I have visited campus within the last month
  - I have already or plan to participate in pre-orientation activities such as Prelusion or evoLUtion
- 7) Have you taken any college courses or attended a college or university prior to enrolling at Lehigh? If yes, please describe what activities you have been involved in.
- 8) Does your family have any history with Lehigh University? (Please select all that apply)
  - My Father attended Lehigh
  - My Mother attended Lehigh
  - My sibling(s) attended Lehigh
  - Another relative attended Lehigh
- 9) Do you have any social connections to Lehigh University? (Please select all that apply)
  - A friend has attended Lehigh
  - A friend will be attending Lehigh with me
  - My boyfriend/girlfriend has or will be attending Lehigh
- 10) What is your relationship status?
  - I am currently in a relationship.
  - I am currently single.
- 11) If you are in a relationship, how often do you see or communicate with your partner?  
\_\_\_\_Daily \_\_\_\_Weekly \_\_\_\_Monthly \_\_\_\_I am not in a relationship

**Interpersonal Support Evaluation List – College Version** (ISEL; Cohen & Hoberman, 1983; Cohen, et al. 1985)

Instructions:

This scale is made up of a list of statements each of which may or may not be true about you. For each statement we would like you to circle probably TRUE (PT) if the statement is true about you or probably false (PF) if the statement is not true about you.

You may find that many of the statements are neither clearly true nor clearly false. In these cases, try to decide quickly whether probably true or probably false is most descriptive of you. Although some questions will be difficult to answer, it is important that you pick one alternative or the other. Remember to circle only one of the alternatives for each statement.

Please read each item quickly but carefully before responding. Remember that this is not a test and there are no right or wrong answers.

***Tangible Scale***

1. I know someone who would loan me \$50 so I could go away for the weekend. I know someone who would give me some old dishes if I moved into my own apartment.
2. I know someone who would loan me \$100 to help pay my tuition.
3. If I needed it, my family would provide me with an allowance and spending money.
4. If I wanted a date for a party next weekend, I know someone at school or in town who would fix me up.
5. I know someone at school or in town who would bring my meals to my room or apartment if I were sick.
6. I don't know anyone who would loan me several hundred dollars to pay a doctor bill or dental bill.
7. I don't know anyone who would give me some old furniture if I moved into my own apartment.
8. Even if I needed it my family would (or could) not give me money for tuition and books.
9. I don't know anyone at school or in town who would help me study for an exam by spending several hours reading me questions.
10. I don't know anyone at school or in town who would loan me their car for a couple of hours.
11. I don't know anyone at school or in town who would get assignments for me from my teachers if I was sick.

***Belonging Scale***

1. There are people at school or in town who I regularly run with, exercise with, or play sports with.
2. I hang out in a friend's room or apartment quite a lot.
3. I can get a date who I enjoy spending time with whenever I want.
4. If I decided at dinner time to take a study break this evening and go to a movie, I could easily find someone to go with me.
5. People hang out in my room or apartment during the day or in the evening.
6. I belong to a group at school or in town that meets regularly or does things together regularly.
7. I am not a member of any social groups (such as church groups, clubs, teams, etc.)
8. Lately, I often feel lonely, like I don't have anyone to reach out to.
9. I don't have friends at school or in town who could comfort me by showing me some physical affection.
10. I don't often get invited to do things with other people.
11. I don't talk to a member of my family at least once a week.
12. I don't usually spend two evenings on the weekend doing something with others.

### *Appraisal Scale*

1. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about problems I might have budgeting my time between school and my social life.
2. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about any problems I might have adjusting to college life.
3. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about sexually transmitted diseases.
4. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about any problems I might have meeting people.
5. I know someone who I see or talk to often with whom I would feel perfectly comfortable discussing any sexual problems I might have.
6. I know someone who I see or talk to often with whom I would feel perfectly comfortable talking about any problems I might have with drugs.
7. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about any problems I might have with making friends.
8. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about any problems I might have getting along with my parents.
9. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about difficulties with my social life.
10. There isn't anyone at school or in town with whom I would feel perfectly comfortable talking about my feelings of loneliness and depression.
11. I don't know anyone at school or in town who makes my problems clearer and easier to understand.
12. Lately, when I've been troubled, I keep things to myself.

\*To score, items can be summed across each subscale and then a total scale score can be obtained. A response of "Probably True" scores 1 and a responses of "Probably false" scores 0. Reverse score items 7-12 for each subscale.

## Social Provisions Scale (SPS; Cutrona & Russell, 1987)

Instructions: In answering the following questions, think about your current relationships with friends, family members, co-workers, community members, and so on. Please indicate to what extent each statement describes your current relationships with other people. Use the following scale to indicate your opinion:

1	2	3	4
Strongly Disagree	Disagree	Agree	Strongly Agree

So, for example, if you feel a statement is very true of your current relationships, you would respond with a 4 (strongly agree). If you feel a statement clearly does not describe your relationships, you would respond with a 1 (strongly disagree).

1. There are people I can depend on to help me if I really need it.
2. I feel that I do not have close personal relationships with other people.\*
3. There is no one I can turn to for guidance in times of stress.\*
4. There are people who depend on me for help.
5. There are people who enjoy the same social activities I do.
6. Other people do not view me as competent.\*
7. I feel personally responsible for the well-being of another person.
8. I feel part of a group of people who share my attitudes and beliefs.
9. I do not think other people respect my skills and abilities.\*
10. If something went wrong, no one would come to my assistance.\*
11. I have close relationships that provide me with a sense of emotional security and well-being.
12. There is someone I could talk to about important decisions in my life.
13. I have relationships where my competence and skill are recognized.
14. There is no one who shares my interests and concerns.\*
15. There is no one who really relies on me for their well-being.\*
16. There is a trustworthy person I could turn to for advice if I were having problems.
17. I feel a strong emotional bond with at least one other person.
18. There is no one I can depend on for aid if I really need it.\*
19. There is no one I feel comfortable talking about problems with.\*
20. There are people who admire my talents and abilities.
21. I lack a feeling of intimacy with another person.\*
22. There is no one who likes to do the things I do.\*
23. There are people I can count on in an emergency.
24. No one needs me to care for them.\*

\*Indicates item should be reverse scored before computing scale total.

## Explicit Ratings of Supportiveness

1. How long have you known \_\_\_\_\_? \_\_\_\_\_ Years \_\_\_\_\_ Months
2. How often do you spend time with \_\_\_\_\_?
3. How often do you communicate with \_\_\_\_\_?

Response scale for 1 & 2:

- Never/Rarely
  - Several times a year
  - Every few months
  - At least once a month
  - Every few weeks
  - Daily
4. How positive or enjoyable do you find your interactions with \_\_\_\_\_?
    - Never positive or enjoyable
    - Rarely positive or enjoyable
    - Sometime positive or enjoyable
    - Usually positive or enjoyable
    - Always positive enjoyable
  5. How emotionally supportive do you find \_\_\_\_\_ in general? Emotionally supportive means that you are comfortable sharing problems with this person and that they make you feel validated.
  6. How informationally supportive do you find \_\_\_\_\_ in general? Informational support can be advice or information about how to solve a problem or deal with a stressful situation.
  7. How instrumentally supportive do you find \_\_\_\_\_ in general? Instrumental support is actual help dealing with the problem.

Response scale for 5, 6 & 7:

- Not at all supportive
  - Not very supportive
  - Somewhat supportive
  - Very supportive
  - Extremely supportive
8. How supportive is \_\_\_\_\_ with regard to the following stressors?
    - I do not share this problem with them
    - Not at all supportive
    - Not very supportive
    - Somewhat supportive
    - Very Supportive Extremely Supportive

\_\_\_\_ Academic  
\_\_\_\_ Romantic/Sexual Relationships  
\_\_\_\_ Social Relationships (Friends/Groups)  
\_\_\_\_ Relationship with Parents

\_\_\_\_ Future  
\_\_\_\_ Work  
\_\_\_\_ Other

\*Participants completed the scale for both Home (T1-T4) and College (T2-T4) close others  
**Perceived Stress Scale (PSS; Cohen Kamarck, & Mermelstein, 1983)**

## INSTRUCTIONS:

The questions in this scale ask you about your feelings and thoughts during THE LAST MONTH. In each case, you will be asked to indicate your response by placing an “X” over the circle representing HOW OFTEN you felt or thought a certain way (Never, Almost Never, Sometimes, Fairly Often, or Very Often) . Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don’t try to count up the number of times you felt a particular way, but rather indicate the alternative that seems like a reasonable estimate.

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous and “stressed”?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that happened that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

**\* To score, reverse-score items 4, 5, 7, and 8 then sum across all 10 items.**

## Appraisal Scale

\* Domains referenced in the following questions were: Academics, Romantic/Sexual Relationships, Social Relationships (Friends/Groups), Relationship with Parents, The Future, Work, and Other

- 1) What aspects or events related to the following domains do you anticipate being stressful in the next several months?
- 2) Please rate how stressful you find each domain to be:
  - Not at all stressful
  - A little stressful
  - Somewhat stressful
  - Very stressful
  - Extremely stressful
- 3) How worried are you about dealing with events from each of the following domains?
  - Not at all worried
  - Somewhat worried
  - Very worried
  - Extremely worried
- 4) How excited are you about dealing with events from each of the following domains?
  - Not at all excited
  - Somewhat excited
  - Very excited
  - Extremely excited
- 5) How confident are you that you have the resources to handle the stress associated with each domain?
  - I am not prepared to handle the stressor
  - I am somewhat prepared to handle the stressor
  - I am mostly prepared to handle the stressor
  - I am completely prepared to handle the stressor

The remaining questions on this page ask you to choose between one of two statements that best reflect your thoughts, feelings, and attitudes towards specific aspects of the domains above. You may choose to fully endorse one statement or the other by choosing “A” or “B”, or you may decide to only partially endorse A or B by choosing “Mostly A” or “Mostly B”.

Please choose the statement that best reflects your viewpoint of \_\_\_\_\_ (domain) \_\_\_\_\_:

Domain	Challenge Statement	Threat Statement
Academics	Doing well in classes may be difficult, but if I put in the necessary effort I think I will do well.	Even if I put in the necessary effort I may not do well in my classes.
	Even though Lehigh is a prestigious university, I think I will be able to perform as well as the other students.	Because Lehigh is so prestigious, I'm not sure I'll be able to compete with the other students academically.
Romantic	Even though it seems risky, I know I will never meet my soul mate if I don't put myself out there.	If I put myself out there, I am not sure anyone would be interested in getting involved with me.
	If a romantic partner ended a relationship with me, I would know that it is probably better in the long run.	If a romantic partner ended a relationship with me, it would be a tremendous blow to my self-esteem.
Social	If I had a disagreement with a friend, I think our relationship would grow as a result of working through our differences.	If I had a disagreement with a friend, I am not sure our relationship would ever be the same again.
	Being at Lehigh is an opportunity to make new friends and explore new interests.	Being at Lehigh makes it difficult to stay in touch with the friends I already have.
Parents	It isn't easy to meet my parent's expectations for me, but I know it's only because they want the best for me.	Even though I know my parents want the best for me, sometimes I feel like nothing I do is good enough.
	If I experienced difficulty with college, my parents would be a source of comfort and encouragement.	If I experienced difficulty with college, my parents would be very disappointed.
Future	Even though the future is uncertain, I think I have what it takes to become successful.	The uncertainty of the future makes me question whether I have what it takes to become successful.
	I am always vigilant for opportunities to advance my plans for the future.	I am always vigilant for obstacles that might disrupt my plans for the future.
Work	College is an opportunity for me to gain the knowledge and skills necessary to make it in this tough job market.	In today's tough job market, I wonder whether I'll be able to find a decent job after college.
	Working up to my dream job will take time and effort, but I look forward to the journey.	Working up to my dream job will take time and effort, and unexpected events could derail my ambitions.

\*Scoring: Threat = 0, Mostly Threat = 1, Mostly Challenge = 2, Challenge = 3; sum all items.

## Rosenberg's Self-Esteem Scale (Rosenberg, 1965)

Below is a list of statements dealing with your general feelings about yourself. If you **STRONGLY AGREE** circle **SA**. If you **AGREE** with the statement circle **A**. If you **DISAGREE** circle **D**. If you **STRONGLY DISAGREE** circle **SD**.

1. I feel that I'm a person of worth, at least on an equal plane with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure.
4. I am able to do things as well as most other people.
5. I feel I do not have much to be proud of.
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself.
9. I certainly feel useless at times.
10. At times I think I am no good at all.

\* SA = 3, A = 2, D = 1, SD = 0; To score, reverse-score: 3, 5, 8, 9, and 10, and then sum across all items.

## Center of Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977)

The 10 items below refer to how you have felt and behaved during the last week. Choose the appropriate answer using the following scale: Rarely or none of the time (<1 day); Some or a little of the time (1-2 days), Occasionally or a moderate amount of the time (3-4 days); Most or all of the time (5-7 days).

1. I was bothered by things that don't usually bother me.
2. I had trouble keeping my mind on what I was doing.
3. I felt depressed.
4. I felt everything I did was an effort.
5. I felt hopeful about the future.
6. I felt fearful.
7. My sleep was restless.
8. I was happy.
9. I felt lonely.
10. I could not get "going".

\* (<1 day) = 0, (1-2 days) = 1, (3-4 days) = 2, (5-7 days) = 3; To score, reverse-score 5 and 8, and then sum across all items.

### Subjective Outcome Items (T4 only)

- 1) What was your GPA for the fall 2010 semester? \_\_\_\_\_
- 2) How satisfied are you with the GPA you earned this semester?
  - Very Dissatisfied
  - Dissatisfied
  - Satisfied
  - Very Satisfied
- 3) At any time during the Fall 2010 semester did you become involved in the following activities of groups (please select all that apply):

<input type="checkbox"/> Fraternity or sorority	<input type="checkbox"/> Theater
<input type="checkbox"/> Academic or Honors Fraternity	<input type="checkbox"/> Band
<input type="checkbox"/> Athletic Team	<input type="checkbox"/> Choir
<input type="checkbox"/> Student Government	<input type="checkbox"/> ASA Student Alumni
<input type="checkbox"/> Dance	<input type="checkbox"/> Cultural Group

Any other clubs or activities (please specify): \_\_\_\_\_
- 4) Which of the following groups or activities do you plan to be involved in during the spring 2011 semester (please select all that apply)? (same list as Question 3)
- 5) How often did you consume alcoholic beverages during the fall 2010 semester?
  - Never
  - Less than monthly
  - Monthly
  - Weekly
  - Daily or almost daily
- 6) On a typical drinking day, how many alcoholic beverages did you consume?  
 None, I do not drink     1     2     3     4     5     6 or more
- 7) How did your expectations for your academic performance (e.g., making friends, adjusting to the dorm, etc.) this semester differ from your actual performance?
  - I performed much worse than I expected I would.
  - I performed worse than I expected I would.
  - I performed exactly what I expected I would.
  - I performed better than I expected I would.
  - I performed much better than I expected I would.
- 8) How did your expectations for the academic experience (e.g., quality of courses) this semester differ from your actual experience?
- 9) How did your expectations for your social life (e.g., making friends, adjusting to the dorm, etc.) this semester differ from your actual experience?
- 10) How did your expectations for being away from home this semester differ from your actual experience?

Response scale for 8, 9 & 10:

  - It was much worse than I expected it to be.
  - It was worse than I expected it to be.
  - It was exactly what I expected it to be.
  - It was better than I expected it to be.
  - It was much better than I expected it to be.

- 11) How satisfied are you with the way you handled stress at Lehigh during the fall 2010 semester?
- 12) How satisfied are you with your social life and interpersonal relationships and experiences at Lehigh during the fall 2010 semester?
- 13) How satisfied are you with your academic performance at Lehigh during the fall 2010 semester?
- 14) How satisfied are you with your academic experiences (e.g., quality of courses) at Lehigh during the fall 2010 semester?

Response scale for 11, 12, 13, & 14:

- Very Dissatisfied
- Dissatisfied
- Satisfied
- Very Satisfied

- 15) How central is being a Lehigh Student to who you are?
  - Not at all central
  - Not very central
  - Somewhat central
  - Extremely central

- 16) Please rate the extent to which your participation in orientation activities influenced your experience in any of the following areas?

\_\_\_\_\_ Academic Experience

\_\_\_\_\_ Academic Performance

\_\_\_\_\_ Social Life and Adjustment

\_\_\_\_\_ Adjustment to being away from home

- Not at all
- A little bit
- Somewhat
- A lot

- 17) Are you still friends with any of the other students you met during orientation?
  - Yes, I am very close with some of the people I met at orientation.
  - Somewhat, I see them around but we don't hang out very much.
  - No, I didn't keep in touch with any of the people I met at orientation.
- 18) In what ways did your orientation experience prepare you for your first semester of college?
- 19) In what ways did your orientation experience NOT prepare you for your first semester of college? Are there things you wish you had known about or been prepared for?
- 20) Please write any other comments or reflections you have about your Fall 2010 college experience:

## VITA

### Courtney E. Ignarri

(cei206@lehigh.edu)

#### SKILLS & EXPERIENCE

---

##### *Communications*

- ◆ **Peer Advisor and Office Assistant, Temple University Honors Program** (Fall 2003–Spring 2006)
  - Provided guidance to students with regard to academic courses and majors, research experience and opportunities, as well as graduate school, grant, and scholarship applications and interview preparation. Assisted with summer orientation, student registration, and course evaluation; Aided in planning and running of undergraduate research conference (TURF/CreWS) and Honors certificate ceremony.
- ◆ **Graduate Committee Student Representative, Lehigh University Psychology Department** (Fall 2007-Spring 2008)
  - Liaison between faculty based Graduate Committee and graduate students
- ◆ **News Editor, Social Psychology Eye Website** (June 2009-June 2010)
  - Wrote entries intended to connect news or current events to social psychology
  - <http://socialpsychologyeye.wordpress.com/>

##### *Organization*

- ◆ **Research Coordinator**
  - Lehigh Coping Lab (Fall 2009- present)/ Social Cognition Lab (Fall 2006-Spring 2009)
  - Managed 3-5 undergraduate research assistants per semester, wrote Institutional Review Board Human Subjects Research Applications, created lab schedule, trained RAs in protocol, programmed computer experiments, created and organized research materials, conducted experimental sessions, managed participant credits and penalties, and conducted statistical analyses
- ◆ **Tech Graduate Assistant, Lehigh University** (Fall 2010 & Spring 2011)
  - Maintained participant pool of 300 undergraduates for Psychology Department: was the direct contact for all student participants, coordinated the participant needs of all researchers, used experimetrix.com and sona-systems.com to assign participants, tabulate credits and penalties for experimental participation
- ◆ **Proctoring Coordinator, Lehigh University Psychology Department** (Fall 2009-Spring 2010)
  - Managed signup and enforcement of exam proctoring schedule for 15 graduate students

##### *Public Relations*

- ◆ **Conference Coordinator Assistant, Society of Experimental Social Psychology Conference** (Fall 2006)
  - Coordinated member registration, check-in, distribution of conference materials, and information desk

##### *Service*

- ◆ **Volunteer at Easton Children's Home** (Spring 2009-present)
  - Secured \$1,000 in funding from ArtsLehigh Grant to take a group of children to the Franklin Institute and take part in a two session clay course at the Banana Factory arts center, Coordinated 6 week art club, volunteered at various events and fundraisers
- ◆ **Lehigh University Institutional Review Board Student Representative** (Spring 2010- present)
  - Reviewed Human Subjects Applications

### *Special Skills*

- ◆ Proficient in statistical software (Excel, SPSS/PASW, and SAS)
- ◆ Proficient in data collection tools (SurveyMonkey, experimetrix, sona-systems, E-prime, and DirectRT)

### *Teaching*

- ◆ **Instructor:** Person Perception, Lehigh University (Summer 2009)
- ◆ **Certification in Teacher Development Course,** Lehigh University (Spring 2009)
- ◆ **Teaching Assistant:** Personality, Lehigh University (Fall 2009 and Spring 2010)
- ◆ **Teaching Assistant:** Abnormal Psychology, Lehigh University (Spring 2009)
- ◆ **Teaching Assistant:** Social Psychology, Lehigh University (Fall 2008)
- ◆ **Teaching Assistant:** Research Methods, Lehigh University (Fall 2007 and Spring 2008)

### **EDUCATION**

---

- MAY 2011      **Ph.D. in Psychology,** LEHIGH UNIVERSITY, BETHLEHEM, PA
- MAY 2009      **Masters of Science in Psychology,** LEHIGH UNIVERSITY, BETHLEHEM, PA
- MAY 2006      **Bachelor of Arts in Psychology,** TEMPLE UNIVERSITY, PHILADELPHIA, PA

### **AWARDS**

---

- ◆ CAS Graduate Research Grant (Summer 2010)
- ◆ CAS Dean's Fellowship, Lehigh University (2006-2007)
- ◆ Summa Cum Laude, Temple University (2006)
- ◆ Dean's List, Temple University (2002-2006)
- ◆ Phi Beta Kappa (2005)
- ◆ Temple Academic Scholarship (2002-2006)
- ◆ Glackin Scholarship (2002-2003)

### **AFFILIATIONS**

---

- ◆ NASPA: Student Affairs Administrators in Higher Education (2011- present)
- ◆ Eastern Psychological Association (2007-2009)
- ◆ American Psychological Association (2005-2007)
- ◆ Temple University Psychology Majors Association (2005-2006)
- ◆ Society for Personality and Social Psychology (2004-2009)
- ◆ Psi Chi Psychological Society (2004-2006)
- ◆ National Society of Collegiate Scholars (2003-2006)