University of Cincinnati

Date: 10/1/2014

I, Charles K. Roberts, hereby submit this original work as part of the requirements for the degree of Doctor of Education in Counselor Education.

It is entitled:
Self-Esteem, Friendship Support, and Depression in College Students

Student’s name: Charles K. Roberts

This work and its defense approved by:

Committee chair: Laura Nabors, Ph.D.
Committee member: Christopher Swoboda, Ph.D.
Committee member: Geoffrey Yager, Ph.D.
Self-Esteem, Friendship Support, and Depression in College Students

A dissertation submitted to the Graduate School in partial fulfillment of the requirements for the degree of DOCTOR OF EDUCATION in the Counseling Program of the College of Education, Criminal Justice and Human Services

October 1, 2014

By

Charles K. Roberts

B.A., Wabash College, 2003

M.A., University of Cincinnati, 2006

Committee: Laura Nabors, Ph.D. (Chair)
Christoper M. Swoboda, Ph.D.
Geoffrey Yager, Ph.D.
Abstract

Depression is an area of concern for college students. College students have higher rates of depression than non-college peers. Additionally, depression is related to multiple risk-taking behaviors and lower performance in school. This study examined the relationships between gender, friendship support, self-esteem and depression ratings in a Midwestern college sample. Undergraduate psychology students completed multiple self-report inventories, including the Rosenberg Self-Esteem Scale and the Multidimensional Scale of Perceived Social Support; and they provided information about the number of days they were depressed or their mental health was not good in the previous month. An additional model was run examining the relationships between the aforementioned variables and the number of days reported with mental health not good. While research shows that all three variables can affect depression in a college student population, the present study found that gender interacted with these measures. On the one hand, increased friendship support seemed to buffer males but especially females from depression. On the other hand, increased self-esteem buffered males from depression more than it buffered females. The additional model showed that self-esteem seems to work across genders to buffer college students from the experience of poor mental health days. Perhaps, when looking to intervene in the lives of the students, universities would be able to tailor interventions based on gender, so that they are able to foster increased friendship support for females and increase self-esteem for males, thereby reducing depression’s impact on students.
Acknowledgments

I would like to thank the tireless efforts of my committee, in particular my chair, for guidance, instruction, and support. This document likely would never have been completed without this help.

I would also like to thank my family, who has long dealt with my absence of mind and/or body as a price associated with continued academic work.
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>i</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>iii</td>
</tr>
<tr>
<td>Table of Contents</td>
<td>iv</td>
</tr>
<tr>
<td>List of Tables</td>
<td>v</td>
</tr>
<tr>
<td><strong>CHAPTERS</strong></td>
<td></td>
</tr>
<tr>
<td>I. Statement of Problem</td>
<td>1</td>
</tr>
<tr>
<td>II. Review of Literature</td>
<td>4</td>
</tr>
<tr>
<td>III. Methods</td>
<td>16</td>
</tr>
<tr>
<td>IV. Results</td>
<td>24</td>
</tr>
<tr>
<td>V. Discussion</td>
<td>29</td>
</tr>
<tr>
<td>References</td>
<td>38</td>
</tr>
<tr>
<td>Appendices</td>
<td>47</td>
</tr>
<tr>
<td>Appendix A: Tables</td>
<td></td>
</tr>
<tr>
<td>Appendix B: IRB Non-Human Subjects</td>
<td></td>
</tr>
</tbody>
</table>
List of Tables

1. Descriptive Statistics for the Sample .................................................................47
2. Number of Days Depressed ..............................................................................48
3. Number of Days with Poor Mental Health ......................................................49
4. MSPSS, Friendship Subscale ..........................................................................50
5. Rosenberg Self-Esteem Scale ..........................................................................51
6. Negative Binomial Regression; Days Depressed ..............................................52
7. Follow Up Regression for Females ..............................................................53
8. Follow Up Regression for Males ....................................................................54
9. Negative Binomial Regression; Days Mental Health Not Good ....................55
CHAPTER ONE

Statement of the Problem

College students, particularly students ages 18-25, experience considerable life transition, which can be stressful (Pittman & Richmond, 2008). According to the National Institute for Mental Health, individuals between the ages of 18 and 25 have an 8% rate of serious mental illness, which is the highest of any age group (www.nimh.nih.gov/statistics/SMI_AASR.shtml) and they show a heightened rate of depressive symptoms (Chandler, Wang, Ketter, & Goodwin, 2008). College students are also experiencing a shift in importance of the type of support they receive: from parents and family to friends and peers (Cheng & Chan, 2004). During the college years, young adults can also experience significant shifts in their self-esteem (Rosenberg, 1965).

Depression in college student populations negatively affects multiple areas of the students’ lives. Recent research on college students showed that more than 33% of college students experienced clinically significant levels of depression (Armstrong & Oomen-Early, 2009). College students who experience depression are at greater risk for increased drinking (Weitzman, 2004), increased risk-taking behaviors (McNair, Carter, & Williams, 1998), poor sleep and health habits (Orzech, Salafsky, & Hamilton, 2011), and poor academic performance (McDermott, Hawkins, Littlefield, & Murray, 1989). Thus, student life officers, school administrators, parents and college students have reason to gain a fuller understanding of the predictors of depression in college student populations.

Current research reports that there are gender differences both in the rates of depressive symptoms reported and the ways in which each gender experiences depressive symptoms. Women are more likely than men to experience depression (Kessler et al., 2005). Women are also more likely to report feelings such as sadness and social withdrawal (Cheng & Furnham,
Males, who tend to avoid reporting sad feelings, are more likely to experience behavioral problems such as aggressiveness. Females also tend to have a larger support system and experience less social conflict. Close confidants are more likely among females than males in same gender friendships (O’Neil, Lance, & Freeman, 1985).

Research on social support and its effects on mental health seem to fall under one of two hypotheses: either (a) social support provides a buffer against the harmful effects of stress and life situations (the Buffering Model) or (b) social support directly reduces the experiencing of stress by an individual (the Direct-Effect Model) (Cohen & Wills, 1985). Both the Buffering and the Direct-Effect models have been shown to be effective ways of evaluating the relationship between stress and mental health and, according to both models, psychological symptoms decrease as social support increases. The present research project will be examining the direct-effects of peer friendship support on depression levels among college students. Sümer, Poyrazli and Grahame (2008) found that lack of social support was a significant predictor of levels of depression, showing that as levels of support decline, depression increases. Many studies have shown that self-esteem and peer social support are two factors that directly influence depression in 18-25 year olds (e.g., Armstrong & Oomen-Early, 2009; Cheng & Furnham, 2003).

Research on self-esteem shows that, in general, as self-esteem increases, depression decreases (e.g., Eisenbarth, 2012). During the college years, students experience any number of life changes. Students may move, friends may move, and their concept of self-worth may be a primary buffer against the development of depression (Sowislo & Orth, 2013). Students with low self-esteem are more vulnerable to the effects of stress. For example, they tend to have a more pessimistic view of their peers (Carbonell, Reinherz, & Giaconia, 1998).
This research project will examine the relationships among self-esteem, perceived friendship support, and gender and the number of days that college students report being affected by feelings of depression. This project will use the Rosenberg Self-Esteem scale as a measure of self-esteem (Rosenberg, 1965) and the friendship subscale of the Multidimensional Scale of Perceived Social Support as a measure of friendship support (Zimet, Dahlem, Zimet, & Farley, 1988) in a Midwestern university student population. It is hypothesized that females will report more days depressed than males, and that students with lower scores on the Rosenberg Self-Esteem Scale and lower scores on the friendship subscale of the Multidimensional Scale of Perceived Social Support will report more days depressed than college students with higher scores on the aforementioned scales.
CHAPTER TWO

Review of the Literature

Research has shown that a person’s self-esteem is correlated negatively with his or her feelings of sadness and experience of depression (Sowislo & Orth, 2013), and that a person's rating of social support is inversely related to his or her ratings of depression and self-esteem (Litwack, Aikins, & Cillessen, 2012). With a goal of better understanding the predictors of depression ratings among college students, the present study used constructs from the Social Cognitive Theory (Bandura, 2012) to guide in the examination of the relationships between social support, self-esteem, gender, and ratings of depression among a sample of college students in the Midwest. The present study is part of a larger research project that was completed at the University of Cincinnati College of Education, Criminal Justice, and Human Services (Nabors, Ritchey, Sebera, & Haney, 2012).

The present study examined the influence of gender, perceived friendship support, and self-esteem on the number of days depressed in a Midwest college student population. Many researchers have looked at predicting depression rates in college students using self-esteem or perceived social support, or both, as predictor variables (e.g., Cheng & Furnham, 2003; Eisenbarth, 2012). Previous studies have used a multitude of different rating scales and measures for social support and for self-esteem (e.g., Jones & Buckingham, 2005). As previously stated, the present study used the Rosenberg Self-Esteem Inventory (Rosenberg, 1965) and the friendship subscale of the Multidimensional Scale of Perceived Social Support (Zimet, et al., 1988) to assess these key variables. It is important to note that social support is a broad construct and various types of support (e.g., support from parents, mentors and friends) contribute to this broad notion. The current study was designed to assess friendship support...
because individuals in transition from adolescence to early adulthood derive the bulk of their support from their peers.

**Social Cognitive Theory**

Social Cognitive Theory is rooted in the causal model of triadic reciprocal determinism (Bandura, 2012). This theory of learning is used to understand human behavior through the reciprocal combination of cognitive processes of the individual person, the social environment of the individual, and the behavior of the individual. This model conceptualizes the cognitions of the person, the social environment, and the behavior of the individual as interactional and dynamic. This model is of relevance to this subject area due to its interactional nature, and pieces of this model are particularly relevant to the current study. The present research endeavor examined the specific cognitions of college students (perceptions of social support and self-esteem) in influencing their behaviors and, in this way, was informed by the Social Cognitive Theory. Perceptions of friendship support were examined as a variable representing the support of others in an individual’s life.

These concepts no doubt interact with the individual’s behavior, forming a reciprocal model (Bandura, 2012). A student, for example, may post things online relating to his or her emotional experiencing or self-esteem, to which the individual’s friends respond. The nature of peers’ responses will likely guide the individual’s future online expressions of emotion and self-image. Bandura suggests that it is in this way that, over time, an individual learns. According to the Social Cognitive Theory, this interaction (interactive determinism) over time alters the individual’s cognitive conceptualization (of self-esteem in this example), which alters his or her expression of emotion, resulting in different social interaction and the completion of the reciprocal process of the model. Social Cognitive Theory likely holds much relevant insight into
an understanding of the many interactive components of depressive symptoms, through a better understanding of the roles of the individual’s behavior, thoughts, and social interactions. As mentioned, Social Cognitive Theory also heralds the concept of self-regulation and moves traditional behavioral concepts toward a model that includes cognitions as driving forces in human behaviors. This study focused on parts of the aforementioned model, chiefly the relationships among self-perceptions (cognitive factors, perceptions of friendship support, self-esteem) and young adults’ report of their experience of depression.

**College Student Depression**

Research shows us that diverse groups of college students present mental health concerns (Hudson, Towey, & Shinar, 2008) and that depression specifically is of concern to college students (Chandler et al., 2008). In fact, according to the National Institute for Mental Health, individuals between the ages of 18 and 25 have an 8% rate of serious mental illness, which is the highest of any age group (www.nimh.nih.gov/statistics/1MDD_ADULT.shtml). Understanding some of the factors that account for the suffering of college-aged individuals through depression and mental health issues is certainly of great importance to the world of healthcare.

Depression, specifically, has been shown to correlate with a number of different serious mental, emotional and behavioral concerns among college students such as compulsive gambling (Petry & Weinstock, 2007), significant and dangerous alcohol consumption (Monahan et al., 2012), significant sleep difficulties, and poor academic performance (Orzech, et al., 2011). College students with poor mental health and depression have been shown to have increased rates of alcohol use and to be at risk for the development of alcohol use disorders. “Compared with their peers, students with PMHD [poor mental health and depression] were less likely to report a lifetime of abstinence; more likely to report drinking but not heavy episodic drinking;
and more likely to report drinking to get drunk” (Weitzman, 2004, p.274). While there is likely a reciprocal relationship between overall health related quality of life, depression, alcohol use and the experience of the consequences of that use, college students who report poorer mental health tend to report higher levels of alcohol consumption (Monahan, Bracken-Minor, McCausland, McDevitt-Murphy, & Murphy, 2012).

In 2005, Kessler et al. published research on the lifetime prevalence and age of onset of DSM-IV disorders, including depression. They found that of the 16.6% of the population that were likely to receive a diagnosis of Major Depressive Disorder in their lifetime, 25% of these cases met criteria by age 19. These researchers also reported that individuals who were likely to receive an Anxiety Disorder diagnosis or Substance Use Disorder diagnosis in their lifetime, 50% met DSM-IV criteria before the age of 25.

Rosenthal and Schreiner (2000) found that as many as 13% of the college student population showed clinically significant depression. Additionally, Rosenthal and Schreiner showed that older college students, over the age of 25, had significantly lower rates of depression than those aged 18 to 25. Similarly, in a study conducted at a medium-sized university in the Pacific Northwest, researchers found that 25% of the student population reported having experienced some degree of depression in the past year (Lindsey, Fabiano, & Stark, 2009).

Thus, the results of several studies suggest that depression is a problem for many college students and is worthy of further examination. More information is needed about resilience factors such as self-esteem and social support related to feelings of sadness for college students in order to provide optimal therapeutic services and design prevention measures for this group of young adults.
Gender Differences in Mental Health Problems and Depression

A look at current research reveals that there are gender differences, both in the rates and experience of mental health problems and depression between males and females. Specifically, college women have been shown to endorse a higher frequency of mental and emotional disturbances and depression compared to men (Rosenthal & Schreiner, 2000). This risk carries into later years as women are 70% more likely than men to experience depression during their lifetime (Kessler et al., 2005).

Research has also shown significant differences in the way that males and females experience the symptoms of depression in their daily lives. Cheng and Furnham (2003) found that females have a tendency to report experiencing mood symptoms of depression (e.g., depressed mood, social withdrawal, sadness). Males are more likely to act out behaviorally, potentially aggressively, and are less likely to report the sadness. Also, it may be that women internalize their upset feelings, which turns into depression when emotions are not released. Conversely, it is more acceptable for men to release feelings and therefore they may not experience the pent up emotions that are related to the development of depression.

Women could experience more depression because they are more concerned with, and aware of, their social milieu and what others think of them compared to males. Men also may be able to release upset feelings more easily through acting out, whereas women are more likely to express emotions by vocalizing feelings of sadness (Cheng & Furnham, 2003). It may be that it is more socially acceptable for women to express feelings of sadness than males. Males, therefore, may be less likely to report sadness and depression for fear of being viewed as functionally impaired by their peers; whereas women reporting the same symptoms are considered only emotional (Hammen & Peters, 1977). However, there is other literature
supporting the notion that gender differences in depression may be overestimated (Vogel, Wester, Heesacker, Boysen, & Seeman, 2006). The lack of clarity in the literature indicates that the influence of this variable continues to need exploration.

There also appear to be significant differences in the ways in which members of each gender experience depression. One key difference between college aged males and females is that females are more likely to have a close confidant than are males (O’Neil et al., 1985). Females are more likely to have had more contact with close friends over any seven day period than males. Women also report higher rates of perceived social support than men (Lepore, 1992). And while the degree of conflict with friends is stable between college males and females, males report a higher rate of conflict within their primary peer support group compared to women (Lepore, 1992). Hence, males may report lower levels of friendship support and higher levels of overt friendship conflict than women. Thus, it remains important to continue assessing the impact of gender. For the current study, it was hypothesized that gender would have a direct influence on depression, with females reporting higher rates of depression than males.

**Social Support**

Social support, as a broad construct, contains several types of support, such as support from a significant other, support from family, and support from friends (Dahlem, Zimet, & Walker, 1991; Kazarian & McCabe, 1991; Zimet et al., 1988). A key component of social support is being connected to others (Williams & Galliher, 2006). Support of friends is a critical social connection for college students. The importance of friends to college students is part of everyday media. For example, over the past years the car manufacturer, Toyota, has advertised its cars drawing a direct comparison between the way in which college-aged adults and their
parents view social interactions and social support networks (Carlyle, 2011). This commercial presents a college-aged adult spending the evening alone at home on a social networking site commenting on how she is happy she has so many friends to interact with on a weekend evening. In this commercial the value this young adult places on friendships is evident, even though it appears to the viewer that she is sitting alone at the kitchen table at home on her laptop. This is consistent with research showing the importance that college students are placing on friendship connections, and also highlights the fact that college students are increasing their social connectedness in new ways, such as the use of electronic media (Manago et al., 2012).

As modern technology evolves, new avenues such as social networking sites provide a different way for college students to develop networks of friends (Manago et al., 2012). This may further increase the importance of friendship support in students’ lives. Bandura reports that “the evolving information technologies increasingly serve as a vehicle for building social networks that transcend the barriers of time and space” (Bandura, 2012, p. 351). These social network sites also become a medium for students to express their emotional concerns. On Facebook, for example, 25% of college student profiles sampled contained expressions of depressive symptoms (Moreno et al., 2011).

However, friendship support is shown as an important factor in the effects of stress on college students, and one of the well-known effects of stress on college students are depressive symptoms (Cohen & Wills, 1985). In a recent study comparing the effects of parenting support and peer support on anxiety and depression ratings among college students, Eldeleklioğlu (2006) found that while parent support and peer support were both negatively correlated with anxiety and depression in college students, peer support was more than twice as influential on depression ratings than support from parents. The present study assessed the importance of peer support in
a similar population of college students and clearly showed a connection between an increase in peer support and a decrease in depression ratings. Other researchers, examining the more general construct of social support, found the same relationship between strong social support and reduced levels of depression. Sümer et al. (2008), for example, revealed that a lack of social support was a significant predictor of depression, showing that as levels of support decline, depression increases. Hirsh (1980) found that returning college students with a weaker support system and fewer close friends were more likely to experience depression. It is possible that, since better peer support and parental support both decrease depression in college students, as shown by Eldeleklioğlu (2006), research that discusses social support in a more general context is heavily influenced by the strength of peer support. Extrapolating from this research, and considering friendship as a key type of social support, it was hypothesized that lower friendship support would be related to higher reports of depression.

Research assessing the influence of optimism and friendship on depression also supports the previous notion. For example, Brissette, Scheirer, and Carver (2002), in researching optimism, found that friendship support, more than optimism, was correlated with a reduction in depressive symptoms. Friendship support seemed to promote better adjustment, and an increased ability to withstand the stressors of college life. Specifically, the quality of the support, rather than simply the number of friends or size of the social network that the individual reported, impacted the individual’s ability to cope. Cohen, Sherrod, and Clark (1986) found that when the quality of friendship support is skilled (and perceived as good by the individual), having an increased number of friends in the support system was correlated with increased ability to cope with life stress. Thus, it is not the number of friends; but rather the perceptions of
the “quality” or positive nature of the support from friends that alters the effects of stress on college students.

In a longitudinal study comparing support of parents to support of peers among adolescent girls, Stice, Ragan, and Randall (2004) found a reciprocal relationship between depressive symptoms and peer support. Among adolescents, girls who began the study with depressive symptoms showed poorer peer support over time and no change in support from parents. This again suggests a negative relationship between peer support and depression. Similarly, in a study examining the effects of peer support among college roommates in conflict, Lepore (1992) showed that good friendship support provides a stress buffer against increases in conflict within the same friendship group.

The current study focused on one specific type of connection -- friendship support. Friendship support was assessed through college students’ report of the connection and emotional support they receive from friends, using the Friendship Support Scale from the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988). This measure is comprised of three subscales; Friendship support, Family support and Significant Other support (Zimet et al., 1988). Cheng and Chan (2004) assessed the importance of friendship support for adolescents using the MSPSS. Their findings indicated that younger adolescents reported a higher rate of support from family over either support from friends or significant others. However, as adolescents’ ages increased, rates of social support from parents declined as rates of social support from friends increased significantly, suggesting that as adolescents enter into young adulthood, the friendship subscale of the MSPSS is of particular relevance.
Self-Esteem

Self-esteem has been studied as a buffer against feelings of depression (Sowislo & Orth, 2013). For example, Hudson, Elek, and Campbell-Grossman (2000) found a negative relationship between self-esteem and depression. College students who had higher self-esteem had fewer depressive symptoms, and college students with lower self-esteem showed more signs and symptoms of depression. Low self-esteem has been shown to decrease an individual’s ability to cope which leads to a higher rate of depression (Eisenbarth, 2012; Pittman & Richmond, 2008); decrease an individual’s ability to socialize which can negatively affect their ability to obtain peer support (Abe, 2004); and increase the likelihood of risk-taking behaviors and high alcohol consumption (Corbin, McNair, & Carter 1996; McNair, et al., 1998).

In 2013, Sowislo and Orth reported on the results of a large-scale meta-analysis of longitudinal studies examining self-esteem and depression. In part, the researchers were comparing two theories to explain the relationship between self-esteem and depression. The vulnerability model of low self-esteem and depression posits that an individual with low self-esteem is made vulnerable, by virtue of the low self-esteem, to depression. The alternate model, known as the scar model, suggests that low self-esteem is correlated with depression because the symptoms of depression reduce an individual's self-esteem. In either case, a college student who holds a belief of low self-worth is significantly more vulnerable to depression than a similar peer with higher self-esteem. Although Sowislo and Orth (2013) indicated that both models are credible, they ultimately concluded that the vulnerability model showed a stronger effect size.

In a study examining the risk factors for depression in late adolescence, Carbonell et al., (1998) reported that adolescents with poor self-esteem also tended to have a more pessimistic view of peers and were at greater risk for significant depressive episodes. Similar findings were
echoed in the study of young adults where researchers sought to investigate excessive reassurance seeking as a factor for the development of depressive symptoms (Joiner & Metalsky, 2001). Specifically, Joiner and Metalsky showed that young adults with poor self-esteem seek out an excessive amount of reassurance from peers, which correlates highly with an increase in depressive symptoms.

In Rosenberg’s (1965) work developing his Self-Esteem Inventory, which is the measure used in the current study, he focused on trying to identify the individual’s attitude toward him- or herself, which he termed “self-attitude,” which is essentially the individual’s belief in his or her worth. Self-esteem is the construct of the product of an individual’s self-evaluation. Thus, a higher score on this instrument (indicating higher self-esteem) will correlate with fewer days depressed.

**Summary**

This research endeavor sought to further examine the relationship between peer support, self-esteem, gender and depression. It was hypothesized that in this sample of college students, students with poor peer support, as measured by the Friendship subscale from the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988), would report more days sad or depressed over the previous month. It was also hypothesized that students who reported lower self-esteem, as measured by the Rosenberg Self-Esteem Inventory (Rosenberg, 1965), would report more days sad or depressed over the previous month. It was further hypothesized that females would report more days sad or depressed than males. Some of the literature examined for this proposal (e.g., Hirsh, 1980; Hudson et al., 2000) suggested possible interactions among predictors. Preliminary investigative data analyses for this project did not
reveal interactions. Thus, no a priori hypotheses were posited regarding interaction terms. However, in the process of thoroughly analyzing the data, interaction terms were explored.

This study served to provide an opportunity to confirm the findings of previous research on depression, friendship support and self-esteem, while also adding to the literature through the expansion of the research utilizing the friendship subscale of the Multidimensional Scale of Perceived Social Support. It is, however, unusual to use a single item to assess a psychological construct such as depression. To enhance the validity of the present research, a second question from the Center for Disease Control’s Health Related Quality of Life 14 item inventory (HRQOL-14) was added and a parallel analysis was performed. If this analysis yielded similar results it was thought that it would support the findings for the prediction of depression. It is hypothesized that the additional parallel set of analyses will show that increases in self-esteem and friendship support will produce similar decreases in days affected by poor mental health.
CHAPTER THREE

Methods

Participants

Subject data is being analyzed from an existing data set of college students from a large, urban Midwestern university who completed surveys in 2008 as part of a research project on transitions to the adult healthcare system (Nabors et al., 2012). This study was approved by a university-based institutional review board. Participants were members of a data pool in the undergraduate psychology department. Students were given credit for participating in the ongoing research data pool even if they did not complete the study or chose not to participate in parts of the study.

In the data set used there were 166 females and 83 males ranging in age from 18 to 25 years of age (see Table 1, Appendix). This sample was 80% Caucasian, 14% African American, and 6% were in what was termed other minority groups (e.g., Latina, Asian). Slightly more than 88% of this sample was under the age of 21. While all subjects were enrolled in the university, 81.2% of the subjects were underclassmen. At 48% the largest percentage of the subjects were enrolled in the College of Arts and Sciences which includes the psychology department with the next highest percentage being just over 12% enrolled in the nursing program.

Measures

Students completed multiple measurement instruments as a part of data collection, including the Multidimensional Scale of Perceived Social Support, the Rosenberg Self-Esteem Scale and the Health-Related Quality of Life 14 item measure from the Centers for Disease Control. As mentioned, a single item from the HRQOL-14 was used as the outcome variable “During the past 30 days, for about how many days have you felt SAD, BLUE or DEPRESSED”
(www.cdc.gov/hrqol/hrqol14_measure.htm) [Days Depressed, DD]. To enhance the validity of the present research, a similar item “now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 was your mental health not good” [Days with Poor Mental Health, PMH] was used as an outcome variable for a parallel set of analyses. The Multidimensional Scale of Perceived Social Support (MSPSS) contains a Friendship subscale which was used as the peer social support variable to predict days depressed as rated on each of the single items used from the HRQOL-14. The total score on the Rosenberg Self-Esteem Scale was used as the rating for self-esteem to predict the number of days depressed and number of days when mental health was not good as rated by aforementioned single items from the HRQOL-14.

The Multidimensional Scale of Perceived Social Support (MSPSS) is a 12-item inventory with Likert scaling that assesses the degree to which an individual feels they have social support (Zimet et al., 1988). The MSPSS was originally developed and validated on samples of undergraduate university students, similar to the sample used in the present study. These 12 items are divided into three subscales, each clarifying the respondents’ feelings of support from three different sources; support from a significant other, family, and friends. Each of the three subscales contains four items. The three subscales do not have any overlapping items. Dahlem et al. (1991) confirmed the internal validity of the MSPSS and completed a factor analysis of the subscales on an urban university student population. They found that the Friendship subscale had internal consistency reliability of .90 when subscales were tested against the Social Support Behaviors Scale (Vaux, Riedel, & Stewart, 1987) and its subscales.

For this study the Friendship subscale, which has been shown to have good independent construct validity, was used (Kazarian & McCabe, 1991). In an effort to evaluate the
psychometric properties of the MSPSS and its subscales, Kazarian and McCabe conducted a study using this measurement tool and several others on a sample of college students and an adolescent inpatient group. When tested against the Social Support Behaviors Scale’s friendship subscales, the Friendship subscale of the MSPSS showed good concurrent validity. The individual ratings for each of the four items on the Friendship subscale were averaged giving a single score for this scale which is consistent with the reviewed research. Therefore, the mean score of the items on the Friendship subscale was used as the measure of peer social support for this study.

The Rosenberg Self-Esteem Scale is comprised of a list of 10 statements to which a respondent is asked to rate their level of agreement: Strongly Agree, Agree, Disagree or Strongly Disagree (Rosenberg, 1965). The Rosenberg Self-Esteem Scale was created as a Gutman scale where half of the items are reverse-coded. Items scored positively are scored in ascending order 1, 2, 3, 4 and items scored negatively are scored 4, 3, 2, 1. When scoring this measure, Rosenberg (1965) recommended that the numerical scores from all items be summed to calculate a total score, and thus the total score is used as a measure of self-esteem. The Rosenberg Scale has been shown to have very good construct validity and correlates highly with other validated measures of self-esteem, such as the Coopersmith Self-Esteem Inventory (Coopersmith, 1967; Rosenberg, 1979). The Rosenberg Scale, as one of the most used measures of self-esteem, has been used across many different age groups and cultures but shows higher reliability with populations younger than middle adulthood (Dobson, Goudy, Keith, & Powers, 1979). Multiple researchers have used the Rosenberg Self-Esteem Scale and found it to be a reliable measure of self-esteem in college student populations (e.g., Armstrong & Oomen-Early, 2009; Bettencourt, Charlton, Eubanks, Kernahan, & Fuller, 1999).
The Health-Related Quality of Life 14 (HRQOL-14) is a 14 item measure that was developed by the Centers for Disease Control (CDC) to assess the overall quality of life as it relates to various dimensions of an individuals’ health (www.cdc.gov/hrqol/hrqol14_measure.htm, 2013). This inventory is broken into three sections; the Healthy Days core module containing four items, the Activity Limitations module containing five items and the Healthy Days Symptoms module containing five items. While this inventory is created as a brief global measure of quality of life, it is not uncommon for parts of this measure to be used in specific assessments (e.g., Zullig, Huebner, Gilman, Patton, & Murray, 2005). In fact, the CDC designed the HRQOL-14 as three sets of questions which could be used independently for shorter administration and to investigate only specific information (http://www.cdc.gov/hrqol/hrqol14_measure.htm). Researchers have found that the individual sections of this instrument (the Healthy Days core module, the Activity Limitations module, and the Healthy Days Symptoms module) have maintained good validity with adults when used independent of one another (Yohannes, Dodd, Morris, & Webb, 2011).

For this study one item from the Healthy Days Symptoms module (during the past 30 days, for about how many days have you felt SAD, BLUE, or DEPRESSED) was used (referred to as Days Depressed [DD] throughout the remainder of this text). This item allows the participant to indicate any number between 0 and 30 on a blank. Researchers have found that the depression item has good construct validity (Newschaffer, 1998) and there are other instances where similar single items have been reliably used to screen for depression (Henkel et al., 2004). Kobau, Safran, Zack, Moriarty, and Chapman, (2004) reviewed the results from more than 1,500 participants who were administered the Behavioral Risk Factor Surveillance System, which includes the HRQOL-14, and compared the results of the larger question base against the results...
of the single item used in the present research project. They found that the use of this single item for depression and the use of the larger HRQOL-14 both showed reliability and construct validity, and either could be used effectively as screening instruments for depression. Normally, single item responses are acceptable in research when they measure self-reported facts (e.g., age, number of years educated). While it is unusual to use a single item response to assess a psychological construct, researchers have suggested that this may be an acceptable way to assess even psychological constructs when the language is clear and unambiguous and the construct being assessed is “sufficiently narrow” and understood by the respondent (Wanous, Reichers, & Hudy, 1997).

To bolster the present research, a parallel set of regression analyses was performed on an additional item from the HRQOL-14. “Now thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 was your mental health not good” referred to as Days with Poor Mental Health (PMH) throughout the remainder of this document (http://www.cdc.gov/hrqol/hrqol14_measure.htm). Respondents reported the number of days in past month their mental health was not good, similar to the depression question being used. Because multiple comparisons were made wherein two sets of regression analyses were performed on the same data set, in order to reduce the risk of type I error, it was necessary to employ Bonferroni correction as a method to counteract the problem of multiple comparisons. This reduced alpha level, \( p \), from .05 to .025.

While it was expected that the results from the PMH regression model would be similar to the results from the DD regression model, it is possible that this would not be the case. It was possible that the respondents would indicate more days of PMH because that question includes
the depression in addition to other, more general mental health problems. It was expected that respondents would endorse fewer DD than days with PMH.

**Procedures**

Participants were informed of the parameters of the study (permission to obtain documentation about their health, and request to fill out multiple paper surveys). Students participating in data collection were given course credit for participation (Psychology Department Subject Pool). Table 1, in the Appendix, provides information about study participants.

Students reviewed and signed consent forms and then completed study measures.

**Data Analysis**

Because less than 2% of cases involved missing data, it was not necessary to employ sophisticated statistical tools to preserve sample size. Cases missing single item values within any scale had the single missing value replaced through mean imputation, and cases missing data for participant gender, dependent variable responses or entire scale responses were listwise deleted. A regression model was used to examine the influence of gender, self-esteem, and friendship support on depression. Interaction terms also were examined. The original sample of subjects was reduced through listwise deletion to a total of 239 participants. One case was listwise deleted due to responses that were non-integer (0.004%). Five cases (0.020%) of the original sample were missing their gender and were listwise deleted as gender could not be imputed. Two cases (0.008%) were deleted for missing data on student mental health and 9 cases (0.036%) were deleted for missing data on DD. For the 2 cases (0.008%) where no items
from a scale were answered, the cases were listwise deleted (1 case for the Friendship subscale
and 1 case for the Rosenberg were deleted).

**Assumptions**

Research has shown that, though self-esteem and perceived social support/friendship are
related, they are independent constructs (Armstrong & Oomen-Early, 2009). Because self-
esteeom and friendship support are correlated, it was necessary to investigate multicolinearity, and
a Pearson Correlation test was run on these two variables. If the Pearson Correlation value was
above .80 for self-esteem and friendship support, the two variables would have been combined.
If the Pearson Correlation test was statistically significant but less than .80 then the three-way
interaction would be omitted (Williams, 2014).

A linear regression analysis was planned in order to examine the relationships between
gender, friendship support and DD ratings. Some students reported zero DD in the past
30; however, if the frequency count showed a high number of cases in the sample who had
endorsed zero DD in the past 30 days, then an alternate to linear regression would be needed. If
more than 20% of the students report 0 DD in the past 30, an alternate method for data analysis
would be considered (Cohen, Cohen, West, & Aiken, 2003). When evaluating count data with the
potential for an inflated number of zeros or a non-normal distribution, there are 3 options in
addition to linear regression that can be considered; zero inflated regression, Poisson regression,
and negative binomial regression.

The zero inflated regression models seek to test “true zeros” from inflated zeros, where
true zeros are likely to be individuals who read and responded with a zero as opposed to
individuals who were not actually responding to the question and just put zero (Statistical
Consulting Group, 2007). Since it is assumed that the majority of the participants who put zero
in response to “number of days sad/depressed”/DD were actually responding to the question, a zero inflated model would not be indicated.

Poisson and negative binomial regression are similar in form. Both are commonly used for count data. While traditional linear regression assumes that the dependent value has normal distribution and is linearly related to the independent variables, Poisson and negative binomial regression do not. Poisson regression is a linear regression analysis that does not assume that the outcome variable has a normal distribution (Statistical Consulting Group, 2007). Poisson regression is conventionally used with an outcome count variable over a fixed period of time. In this case the outcome variable is a count variable “number of days sad/depressed”/DD and the count variable is limited “during the past 30 days”(www.cdc.gov/hrqol/hrqol14_measure.htm). If more than 20% of the outcome variables were zeros and there was, therefore, not a normal distribution, Poisson regression may be a more appropriate tool.

Negative binomial regression is similar to Poisson regression in that it does not assume that the distribution of the dependent variable is normally distributed. However, negative binomial regression differs from Poisson regression significantly in that negative binomial regression additionally corrects for overdispersion in the data (Piza, 2012). Therefore, the decision between the use of negative binomial regression and Poisson regression hinged on the distribution of the dependent variable. Since there was an excessive number of zero’s and an alternate form of regression was needed, and a preliminary analysis of negative binomial regression and Poisson regression was conducted, the model with the higher goodness of fit value was selected (Piza, 2012).Since multiple comparisons were used, Bonferonni adjustments to the $p$ value were made.
CHAPTER FOUR

Results

Mean imputation was used to replace missing scale item values when only one response was missing prior to calculating the means scores. The total score on the Rosenberg Self-Esteem Scale was calculated by summing all values for each participant, using imputed values on the missing values. The average score on the MSPSS Friendship Subscale was calculated by averaging the responses on the 4 subscale items for each participant. Tables 2 through 5, in the Appendix, present descriptive information about study variables.

Insert Tables 2 through 5 about here

Some students reported 0 DD. However, because it was not expected that an excessive number of students would endorse 0 DD or that the distribution would not be normal; thus, the plan was to perform conventional linear regression analysis using the calculated variable scores for self-esteem, perceived friendship support, gender, and two- and three-way interactions against the outcome variable of DD. A first pass regression analysis was performed on all variables at the same time including the calculated interaction variables. This stepwise regression controlled for each of the other variables and, while it was hypothesized that interactions between these variables may have some influence on the outcome variable of DD, it was not believed that all of these interactions would hold predictive power. Therefore, several additional regression models were run. Each model was evaluated as to whether variables add to the $R^2$ and add to the predictive power of the model. This process would be ongoing for each two-way interaction term and the three-way interaction term. If, however, the values were correlated at a statistically significant level the three-way interaction would be omitted due to multicollinearity (Williams, 2014). As interaction terms were tested and determined to not add
to the $R^2$ of the model, they were removed from the model. This allowed for a determination of whether the variable was significant or if it added to the amount of variance that the regression model was predicting. If the new variable being tested did not add to the predictive power it was not included in the final model.

A Pearson correlation test was run between the dependent variables DD and PMH resulting in a correlation of $r = .411, p<.001$. This indicated that, while these variables are related in a statistically significant way, these variables do not represent a duplication of ratings for this population. A Pearson correlation test was run to assess the relationship between Friendship values (MSPSS Friendship Subscale scores) and Self-Esteem values (Rosenberg Self-Esteem scores) resulting in a correlation of $r = .205 (p<.001)$. A frequency count was run on subject responses showing that 19.2% of subjects reported 0 days with PMH and 26.4% of subjects reported 0 DD. Because more than 20% of the subjects reported 0 DD in the past 30 days, linear regression was not appropriate. A preliminary Poisson and negative binomial regression analyses were performed. The negative binomial regression analysis showed a stronger Pearson Chi-Square goodness of fit value, and thus negative binomial regression was selected as the analysis for this project. Mean number of DD was 6.23 ($SD = 8.82$), range from 0 to over 30 days per month. Mean score on the Rosenberg Self-Esteem scale was 32.42 ($SD = 4.88$, range $= 19$-$40$) and the mean friendship subscale score was 5.67 ($SD = 1.23$, range $= 1$-$7$).

Results of two independent $t$-tests indicated that females were more likely to report a higher number of DD, $t(1, 237) = 3.080, p = .002$, and days when their PMH compared to males, $t(1, 237) = 2.397, p = .017$. Mean scores for females’ reports of DD ($M = 7.32, SD = 2.08$) were higher than DD for males ($M = 3.81, SD = 6.53$). Males mean number of PMH ($M = 5.02, SD = 6.88$) were lower than females’ number of days with PMH ($M = 7.32, SD = 7.08$).
A negative binomial regression analysis was completed on 239 subjects, using DD as the dependent variable. Results are presented in Table 6 of the Appendix.

Covariates were gender, the score for the Rosenberg Self-Esteem inventory, and the score for the MSPSS Friendship subscale. Additionally, the interaction between gender and perceived friendship support as well as the interaction between gender and self-esteem were tested as covariates. The Pearson Chi-Square goodness of fit value was 397.731, indicating a strong model, and the Omnibus test, with a Likelihood Ratio Chi-Square of 84.226 and degrees of freedom of 5, showed a significant overall model \( (p < .001) \) at alpha .025.

Independently, gender and level of self-esteem were not significant predictors of DD at the alpha level of .025. The Friendship subscale of the MSPSS, however, was shown to be significant \( (p = .007) \) with a confidence interval of -.658 to -.271. The expected log count for the Friendship subscale decreased by .464 indicating that as the score on the Friendship subscale increases the number of DD reported will decrease.

The interaction between the Friendship subscale of the MSPSS and gender and the interaction between gender and level of self-esteem were also significant with \( p \) values of .007 and .005 respectively. The confidence interval for the interaction between the Friendship subscale of the MSPSS and gender was .136 to .867 and the confidence interval for the interaction between the level of self-esteem and gender was -.162 to -.029. The expected log count for the interaction between the Friendship subscale and gender increased by .502 indicating that friendship scores had a different effect for males than for females. The expected log count for the interaction between gender and Rosenberg Self-Esteem scale decreased by
.096. This indicated that the self-esteem ratings impacted DD scores in males and females differently.

To examine the interactions, follow up negative binomial regression analyses were conducted for females and for males, with the MSPSS Friendship support scale and the Rosenberg Self-Esteem scores as predictors (see Tables 7 and 8, Appendix).

The female model had a Pearson Chi-Square of 203.499, and an Omnibus Test Likelihood Ration Chi-Square of 36.55 with degrees of freedom of 2, and was significant ($p<.001$). This model revealed that Friendship support ($M = 5.71, SD = 1.26$) significantly influenced reporting of DD ($p<.001$) while self-esteem did not ($p=.104$). The expected log count for the MSPSS Friendship subscale for females decreased by -.464, with a confidence interval of -.658 to -.271. For females, as friendship support increased, DD decreased.

The male model had a Pearson Chi-Square of 194.23, and an Omnibus Test Likelihood Ration Chi-Square of 28.95 with degrees of freedom of 2, and was significant ($p<.001$). This model revealed that self-esteem ($M = 32.78, SD = 5.00$) significantly influenced reporting of DD ($p<.001$) while friendship support ($p = .814$) did not. The expected log count for the Rosenberg Self-Esteem inventory for males decreased by -.126, with a confidence interval of -.182 to -.071, indicating that for males, as self-esteem increased, DD decreased.

Additionally, a negative binomial regression analysis was completed on the same 239 subjects, using the same covariates and the different dependent variable assessing PMH (see Table 9, Appendix).
The mean score PMH was 6.54 (\(SD = 7.09\), range = 0-30). This model had a Pearson Chi-Square of 248.01, and an Omnibus Test Likelihood Ratio Chi-Square of 34.28 with degrees of freedom of 5, and was also significant (\(p < .001\)).

Independently, gender, the Friendship subscale of the MSPSS, as well as the interaction of gender and the Friendship subscale, as well as the interaction of gender and the Rosenberg Self-Esteem scale were not significant. The Rosenberg Self-Esteem scale, with a confidence interval of \(-.1\) to \(-.034\), was significant (\(p < .001\)). The expected log count for the Rosenberg Self-Esteem scale decreased by \(.067\). This indicates that participants who reported higher self-esteem reported fewer days of PMH.
CHAPTER FIVE

Discussion

Summary of Study Findings

This study examined the relationship between gender, friendship support, and self-esteem and reports of depression (DD) in a Midwestern college student population. Additionally, another regression model was developed to examine the impact of the aforementioned variables on college students’ reports of number of days per month with poor mental health (PMH). This second model was developed to investigate whether variables had the same impact on a similar outcome variable. Thus, the additional model served as both a confirmatory and exploratory model.

It is noteworthy that the current study was conducted using a sample of undergraduate psychology students, and was not a clinical sample. According to Weitzman (2004) who surveyed students attending 119 universities, approximately 5 percent of college students nationally are struggling with poor mental health and depression, and approximately 81 percent of students are affected at least some of the time. With just under 80 percent of the current sample reporting at least one day depressed (DD) and 81 percent reporting at least one day with poor mental health (PMH), the students participating in this study are reporting levels of depression that are consistent with those reported by Weitzman. However, some of the students reported no depression, and this was just over twenty percent of the sample, indicating that a group was doing very well. With an average of 6 DD per month and 7 days with PMH per month, it appeared that many of the participants in this study might still need support to cope with mental health concerns and prevent more serious problems occurring or increases in the number of DD or PMH each month.
Previous research in this area suggests that gender, self-esteem, and friendship support all have the potential to influence depression ratings in this population (e.g., Cheng & Furnham, 2003; Eisenbarth, 2012). The present study found that students reporting higher levels of friendship support also reported fewer DD. Litwack, Aikins and Cillessen (2012), in studying a diverse group of adolescents, also found that higher levels of support were related to reports of less depression. Results from this study also indicated that females reported more DD than males, which was expected based on previous research (Sowislo & Orth, 2013). Contrary to expectations, self-esteem did not have a significant main effect on reports of DD. Self-esteem did interact with gender, however, to have a significant impact on ratings of DD. The interaction of gender and friendship support also influenced college students’ ratings of DD each month. Thus, results of the present study indicated that males and females had different protective factors related to their experience of DD each month.

Finding that gender differences in reports of friendship support and self-esteem and reports of DD were experienced by college youth is consistent with previous research (e.g., Rosenthal & Schreiver, 2000). In this study for males, an increase in self-esteem was shown to reduce their reports of DD. In contrast, self-esteem did not significantly influence females’ reports. Additionally, friendship support was not related to males’ reports of DD. Conversely for females, findings indicated that an increase in friendship support was related to reports of fewer DD. Females may rely on social support to combat depression (Eldeleklioğlu, 2006).

**Gender**

As hypothesized, females reported a higher average number of DD than males. This is consistent with previous literature showing that women endorse a higher frequency of mental and emotional disturbances and depression compared to men (Rosenthal & Schreiver, 2000).
which is also congruent with research by Hammen and Peters (1977) suggesting that females are more likely than males to report feeling depressed. Females also reported more days of PMH compared to males. It is possible that women are simply more expressive about their experiences of DD and about their PMH. For example, Chang and Furnham (2003) discovered that women are more likely than men to express their sadness in terms of mood symptoms, whereas men often act out physically rather than identifying themselves as “depressed.” Our self-report item assessed days sad and thus did not specifically assess differences in how women and men experience depression, with expression of depressed feelings (common for females) or acting out of depressed feelings (more common for males). Specific ways that college students who are male or female react to or deal with their depression need to be examined in future studies. Therefore, finding out more about how males and females cope with depressed feelings is an important area for future research.

Additional gender differences are seen when comparing the number of DD for each gender with the number of days with PMH for each gender. Females reported similar numbers of DD and PMH. Males, however, reported fewer DD than days experiencing PMH. These differences could lend support to the notion that males and females conceptualize these concepts differently. This thought is merely speculative, and the underlying differences remain to be examined in future research.

Still, much of the existing literature in the area of college student depression outlines gender differences in the expression of depressive symptoms (e.g., Chang & Furnham, 2003) or the differences in the rates of reported depression (e.g., Sowislo & Orth, 2013), and does not specifically address the possibility that protective factors influencing depression may differ based on gender. The present study extended the existing research by examining gender
differences in two factors that may buffer males and females from depression, showing that friendship and self-esteem seem to have differing types of effects on females’ and males’ reports of DD. Literature related to these key findings will be discussed in the following section of this document.

**Friendship**

Analyses indicated a main effect for ratings of friendship and report of DD by college students. In general, friendship was a positive buffer against depression for all students in the sample for this study. Hence, counselors working with college student populations should consider stressing friendships as a factor that can be related to reduced levels of sadness for college students. Moreover, working to improve social support is a possible front-line intervention for students’ experiencing sadness (Sümer et al., 2008).

As previously mentioned, exploration of the interaction term suggested that friendship support was more important for females. Specifically, examination of the significant interaction between gender and friendship indicated that friendship support was related to lower reports of DD for females but not for males, showing that males and females respond differently to friendship support. Eldeleklioğlu (2006), in examining gender differences in support, reported that for females, friendship support was the most important type of support, while for males, there was no difference between support from parents and support from peers. Lepore (1992) while researching the comparative effects of social conflict and social support in college students, found that females indicated a higher level of friendship support than males, and that the support seemed to have a greater effect than the conflict on their mood state. Additionally, conducting research in London, Cheng and Furnham (2003) found that friendship support for college aged individuals may function differently for females and act, for them, as a buffer to the
experience of depression. One explanation for this could be that females simply have more intensely developed social networks of friends, a possibility supported by Hirsch (1980) who found that women had more extensively developed peer networks than men.

**Self-Esteem**

The main effect of self-esteem was not significantly related to reports of DD for the college students participating in this study. As stated, however, there was an interaction between gender and self-esteem. Findings indicated males with higher self-esteem reported fewer DD; however, self-esteem was not significantly associated with females’ reports of DD. Hence, sense of self-worth may be inextricably linked to lower risk for feelings of sadness in males while the same was not true for females.

Self-esteem is generally shown in the literature as a factor influencing depression ratings in a variety of ways. Self-esteem, when low, has been shown to reduce an individual’s ability to cope, thereby leading to increases in depression rates (e.g., Eisenbarth, 2012; Pittman & Richmond, 2008). Abe (2004) showed that self-esteem can interfere with an individual’s ability to socialize and thereby make it more difficult for the individual to obtain peer support. Perhaps this is the reason that self-esteem is so important for males, since it is well established in the literature that while females tend to be more emotive, males tend to express difficulties more behaviorally (Cheng & Furnham, 2003). This concept is further supported by Carbonell et al. (2008) who showed that adolescents with low self-esteem also tend to have a more pessimistic view of peers.

**Impact of Gender, Self-Esteem, and Friendship Support on Days with Poor Mental Health**

The regression model examining the impact of gender, self-esteem, and friendship support on PMH yielded different findings compared to the primary model, focusing on college
students’ reports of DD per month. In the PMH model gender was not shown as a statistically significant factor, nor was any interaction involving gender. Friendship support, also, was not a significant factor in impacting the reported PMH. Interestingly, however, in this model self-esteem was significantly related to PMH for both males and females, with higher self-esteem correlating with a reduction in PMH. This is consistent with literature showing the buffering effects of self-esteem, as it buffers against negative states of mental health. For example, Eisenbarth (2012), while researching the buffering effects of self-esteem on individuals’ abilities to cope with stress, showed that increases in self-esteem were related to an increase in abilities to cope with stress and a decrease in reported symptoms of depression. The literature supports a relationship between self-esteem and other psychological problems. Cohen and Wills (1985) indicated that stress is a leading indicator of depressive symptoms in college students, and that self-esteem is an established buffer against the impact of stress on college students.

Since the Pearson correlation test showed that DD and PMH were correlated but were not the same, it was expected that the additional model on PMH would differ from the DD. It is possible that findings for this model differed from the model for DD because this model examined a non-specific idea (poor mental health), whereas the DD model examined a widely-known and concretely defined topic. Specifically, the regression model for DD was evaluating only one concept, depression, whereas the model for PMH included or could include many symptoms or concepts, from stress and problems with emotions, to symptoms associated with depression, psychotic episodes, anxiety, etc.

Clinical Implications

Depression is a significant concern during late adolescence and early adulthood, and college populations are key groups for the mental health community to reach in terms of
prevention and intervention efforts. The present study helps gain a further understanding of what factors play a key role in the reduction of depression among college students. Improving friendships may provide the social support to buffer both males and females against sad feelings, being even more important for females compared to males. For females, increasing friendship support may be key to decreasing depression symptoms. On the other hand, for males, helping them find ways to build self-esteem might be an important factor in reducing depression. For males, higher feelings of self-worth may be a good buffer against depression. In the broader context, finding ways to improve self-esteem may be key to reducing students’ experiences of their mental health as “poor.” College mental health counselors who are seeking to intervene to improve mental health and decrease depression on college campuses may elect to provide generalized interventions aimed at improving student support and positive thinking to improve the mental health of college students.

**Limitations**

Several factors may have limited the generalizability of study findings. First, a single item was used to measure depression. Though this is considered acceptable in the literature, and it is widely known that the concept of depression is generally well understood (e.g., Henkel, et al, 2004), it is not always advisable to use one question to assess a concept. It is possible that individuals who are experiencing depression, whereas they meet the diagnostic criteria for depression, but do not identify themselves as “depressed.” Thus, utilizing self-report as a means of determining student levels of depression could underestimate their experience of depression. On the other hand, individuals who do not meet diagnostic criteria for depression but are, instead, experiencing sadness may, in fact, report themselves as being “depressed” because the single item does not give any context beyond whether or not an individual “is depressed” and
leaves the diagnostic assessment up to the individual making the self-report. The same type of arguments hold true for using a single item to assess perceptions of mental health. Self-report data was used without the use of corroborative data (e.g., doctors or assessors impressions). The quality of friendship support was not assessed and this may also impact college students’ experiences of depression and days of poor mental health (Cohen et al., 1986). The support scale consisted of subscales assessing other types of support which were not analyzed, and the relations among family support and its interaction with friendship support should be examined in future analyses. Finally, this study was cross-sectional in nature and only assessed the participants at a single fixed point in time. It is well documented in the literature that reports of an individual’s mental health and depression changes over time (e.g., Stice, Ragan & Randall, 2004).

To correct for these limitations, future research might use a standardized measure for depression, such as the Beck Depression Inventory (BDI). This measure would allow for a more generalizable assessment of depression, and serve to clarify any ambiguity that might be experienced by the participant, thereby increasing the likelihood that each participant’s score would be a more accurate representation of their depression. Furthermore, if the BDI as well as the assessments for self-esteem and friendship support were given to each participant on multiple occasions, it might be possible to examine the influence and impact of the variables on each other over time. This would allow for a far more detailed and in depth examination of the relationships between these variables.

Conclusions

This study extended the current literature by focusing on friendship and self-esteem as predictors of depression reported by males and females. As hypothesized, females reported more
days depressed than males. Friendship support and self-esteem had different buffering features for males and females. Friendship support was significant, especially for females, and for males self-esteem was a positive buffer against depression. Self-esteem was shown to impact student reports of PMH irrespective of whether participants were males or females. Thus, including interventions to improve friendship support in college students is important for prevention and intervention efforts to reduce depression and improving self-worth may positively impact college students’ general reports of their mental health. Future research should examine the long-term impact of interventions with college students and determine if the interventions are related to positive states of mental health during times when college students are coping with stressful life events.
References


among college students. *College Student Journal, 43*(4, PtA), 999-1014.


doi:10.1177/0272431610387142


doi:10.5993/AJHB.36.3.1


Table 1.

Descriptive Statistics for the Sample

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>81</td>
<td>33.9</td>
</tr>
<tr>
<td>Female</td>
<td>158</td>
<td>66.1</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caucasian</td>
<td>193</td>
<td>80.8</td>
</tr>
<tr>
<td>African American</td>
<td>32</td>
<td>13.4</td>
</tr>
<tr>
<td>Other Minority</td>
<td>14</td>
<td>5.8</td>
</tr>
</tbody>
</table>
Table 2.

*Number of Days Depressed Reported by Males and Females*

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.462</td>
<td>3.815</td>
<td>6.226</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>9.569</td>
<td>6.533</td>
<td>8.817</td>
</tr>
<tr>
<td>Range</td>
<td>0-30</td>
<td>0-30</td>
<td>0-30</td>
</tr>
</tbody>
</table>
Table 3.

*Number of Days with Poor Mental Health Reported by Males and Females*

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>7.323</td>
<td>5.025</td>
<td>6.544</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>7.085</td>
<td>6.877</td>
<td>7.085</td>
</tr>
<tr>
<td>Range</td>
<td>0-30</td>
<td>0-30</td>
<td>0-30</td>
</tr>
</tbody>
</table>
Table 4.

Scores for the Multidimensional Scale of Perceived Social Support, Friendship Subscale

Reported by Males and Females

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>5.713</td>
<td>5.601</td>
<td>5.675</td>
</tr>
<tr>
<td>Std. Deviation</td>
<td>1.260</td>
<td>1.166</td>
<td>1.228</td>
</tr>
<tr>
<td>Range</td>
<td>1-7</td>
<td>1.75-7</td>
<td>1-7</td>
</tr>
</tbody>
</table>
Table 5.

*Scores for the Rosenberg Self-Esteem Scale for Males and Females*

<table>
<thead>
<tr>
<th></th>
<th>Female</th>
<th>Male</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean</strong></td>
<td>32.224</td>
<td>32.797</td>
<td>32.418</td>
</tr>
<tr>
<td><strong>Std. Deviation</strong></td>
<td>4.826</td>
<td>5.000</td>
<td>4.882</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>20-40</td>
<td>19-40</td>
<td>19-40</td>
</tr>
</tbody>
</table>
Table 6.

*Negative Binomial Regression for DD*

<table>
<thead>
<tr>
<th>Source</th>
<th>Type III</th>
<th>β</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td>-.471</td>
<td>1.499</td>
<td>.098</td>
<td>1</td>
<td>.754</td>
</tr>
<tr>
<td>MSPSS Friendship Scale</td>
<td></td>
<td>-.464</td>
<td>.099</td>
<td>22.160</td>
<td>1</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Rosenberg Self-Esteem Scale</td>
<td></td>
<td>-.031</td>
<td>.019</td>
<td>2.647</td>
<td>1</td>
<td>.104</td>
</tr>
<tr>
<td>Interaction</td>
<td></td>
<td>.502</td>
<td>.187</td>
<td>7.221</td>
<td>1</td>
<td>.007*</td>
</tr>
<tr>
<td>Gender*MSPSS</td>
<td></td>
<td>-.096</td>
<td>.034</td>
<td>7.900</td>
<td>1</td>
<td>.005*</td>
</tr>
</tbody>
</table>

*Indicates significant at alpha .025*
Table 7.

*Follow Up Regression for Females for DD*

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSPSS Friendship Scale</td>
<td>-.464</td>
<td>.099</td>
<td>22.160</td>
<td>1</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Rosenberg Self-Esteem Scale</td>
<td>-.031</td>
<td>.019</td>
<td>2.647</td>
<td>1</td>
<td>.104</td>
</tr>
</tbody>
</table>

*Indicates significant at alpha .025
Table 8.

*Follow Up Regression for Males for DD*

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSPSS Friendship Scale</td>
<td>.037</td>
<td>.159</td>
<td>.055</td>
<td>1</td>
<td>.814</td>
</tr>
<tr>
<td>Rosenberg Self-Esteem</td>
<td>-.126</td>
<td>.028</td>
<td>19.984</td>
<td>1</td>
<td>&lt;.001*</td>
</tr>
</tbody>
</table>

*Indicates significant at alpha .025*
Table 9.  

**Negative Binomial Regression for PMH**

<table>
<thead>
<tr>
<th>Source</th>
<th>β</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>.119</td>
<td>1.117</td>
<td>.011</td>
<td>1</td>
<td>.915</td>
</tr>
<tr>
<td>MSPSS Friendship Scale</td>
<td>-.004</td>
<td>.05</td>
<td>.004</td>
<td>1</td>
<td>.949</td>
</tr>
<tr>
<td>Scale</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rosenberg Self Esteem</td>
<td>-.067</td>
<td>.017</td>
<td>16.080</td>
<td>1</td>
<td>&lt;.001*</td>
</tr>
<tr>
<td>Interaction</td>
<td>-.038</td>
<td>.140</td>
<td>.072</td>
<td>1</td>
<td>.788</td>
</tr>
<tr>
<td>Gender*MSPSS</td>
<td>-.009</td>
<td>.030</td>
<td>.084</td>
<td>1</td>
<td>.772</td>
</tr>
<tr>
<td>Gender*Level of Self-Esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Indicates significant at alpha .025
TO: Laura Nabors, Ph.D  
FROM: Michael Linke, Ph.D., Chairman  
       University of Cincinnati  
       Institutional Review Board  
DATE: June 15, 2012  
RE: Protocol# 07-08-03-03: Young Adults' Attitudes and Transition to Adult Health Care  

Please be advised that during continuing review, it has been determined that the current work described in this project is not research involving human subjects. No further modifications or continuing review are necessary for maintenance of this study.

Thank you for your continued compliance with the Board's requirements with regard to your research activities.
UNIVERSITY OF CINCINNATI IRB
FINANCIAL CONFLICT OF INTEREST STATEMENT

Please complete and return with any protocol submitted for initial and continuing review.
Name of PI: Laura Naboras Ph.D. IRB #: _
Study Sponsor Name: Sponsor Protocol Number: 07-08-03-03-E
Study Title: Young Adults’ Attitudes and Transition to Adult Health Care

Person Signing Form: Charles K. Roberts Role in Study: Investigator

Study Responsibilities (check all that apply):
- Screen Participants
- Perform Physical Exam
- Record Medical History
- Determine Eligibility
- Administer Consent
- Randomize Participants
- Dispense Study Drug
- Drug Accountability
- Assess AEs
- Complete CRFs
- Discharge Instructions
- Follow-up Phone Calls
- Complete Source Documents
- Sign Data Query Forms
- Other

In order to protect participants from financial conflicts of interest the IRB requires that such potential conflicts during the past 12 months be disclosed. If the IRB determines that a conflict exists that could influence the research or jeopardize the well-being of participants, the IRB may require additional information about the conflict or may require that the conflict be resolved before the research is approved. In addition, it may require that the conflict be disclosed to the participant in the Informed Consent Statement.

Please indicate the following:
- Yes ☐ No ☑ I or a member of my immediate family own(s) equity (stock ownership, stock options, convertible note(s), or other ownership interest in any amount) in the company or other legal entity whose drug, procedure, technique, device, or software I am testing (the “Company”).
- Yes ☐ No ☑ The Company holds patent rights to inventions created by me or a member of my immediate family (spouse, children, parent, in-laws, and siblings).
- Yes ☐ No ☑ I or a member of my immediate family hold(s) a position of senior management officer, or director of the Company.
- Yes ☐ No ☑ I or a member of my immediate family am/is a scientific advisor, consultant, or speaker for the Company and receive payments from the Company (including direct or indirect payments, honoraria, and all other forms of compensation).
- Yes ☐ No ☑ If a device, technique, software, or procedure involved in the research is marketed, I or a member of my immediate family may be entitled to royalty income or income from the sale of the product.
- Yes ☐ No ☑ I or a member of my immediate family have any other financial interest that may appear to conflict with the protection of subjects or which should be disclosed to subjects in order to secure informed consent.

IF ANY BOX ABOVE IS CHECKED YES, INCLUDE ON A SEPARATE SHEET AN EXPLANATION OF THE CONFLICT (INCLUDING THE AMOUNT OF MONEY) FOR THE IRB’S CONSIDERATION. INFORMATION PROVIDED IS CONSIDERED CONFIDENTIAL.

My signature below is my representation that I have accurately completed this form to the best of my knowledge.

Signature of Investigator/Sub-investigator  Date 4/3/12

Revised 05-29-2009-cn
Principal Investigator: Laura Nabors, PH D

This Report must be returned to M/L 0567 by: 05/01/12 Medical Committee

Instructions: Research protocols are approved for a maximum period of one year. In order to determine whether continuance of IRB approval is warranted, it is the investigator's responsibility to submit this report for continuing review which must contain the following information pursuant to the IRB's charge by DHHS regulations 45 CFR 46.109(E) and FDA regulations 21 CFR 56.1093. IRB continuing review is required in order to maintain approval and any changes in the study must be approved by the IRB prior to implementation. Additional pages can be used as necessary.

Protocol # : 07-08-03-03-E Initial Approval Date 09/13/07 Committee # 2
Report Period: 06/24/11 to 06/24/12
Department / Company: A&S Psychology M/L: 0668
Address:
Title: Young Adults' Attitudes and Transition to Adult Health Care

Co-Investigators:
Charles K Roberts, M A

Certification of Principal & Co-Principal Investigators(s)

PI Signature: _____________________________ Date: _____________________________
Laura Nabors, PH D

Co-PI Signature: _____________________________ Date: 4/3/12

Protocol E-mail: naborsla@email.uc.edu