The Company You Keep:
The Relationship between Friendship Qualities and Mental Health among Undergraduates

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Abstract

Prior research has shown that stress and mental illnesses increase during college years. Strong social support may contribute to better mental health while weak social support may exacerbate mental illnesses. Because college students tend to be in an environment away from family and childhood friends, I hypothesize that college friendships have an important impact on mental health. This study investigated how friendship qualities contributed to mental conditions among Duke University undergraduates. Data were collected through a mixed methods online survey. Positive Friendship Qualities (PFQ) was composed of measures of stimulating companionship, help, intimacy, reliable alliance, self-validation, and emotional security. Negative Friendship Qualities was composed of measures of conflict resolution ease, conflict resolution frequency, dishonesty, competitiveness, and superficiality. Depression, loneliness, social anxiety, and positive affect were used to measure mental conditions. Participants answered the friendship qualities questions for their closest friend at Duke. As predicted, PFQ significantly predicted depression, loneliness, social anxiety, and positive affect. PFQ was also inversely correlated with depression, loneliness, and social anxiety. All the correlations between friendship qualities and mental conditions were significant and strong among women, freshmen, and underrepresented minorities. Participants who were not part of a friend group reported feeling less intimate with their closest friend compared with those with a friend group. These results suggest that women, freshmen, and underrepresented minorities who have a positive and fulfilling relationship with a close friend may have stronger ability to navigate life stressors. Implications for this study include suggestions for maintaining student retention rates by introducing interventions for students whose mental health are dependent on social support but do not have fulfilling friendships at Duke.
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Introduction

This research focuses specifically on undergraduate students because they are often navigating and experimenting with friendships and relationships during a critical and unfamiliar point in their lives. Friendships and social bonds are important as students explore their growing identity and need someone to rely on in a new environment (Pittman and Richmond, 2010). The mental health of college students is often studied, and research has shown that their mental health tends to deteriorate during their undergraduate career due to various factors such as difficult classes, busy schedules, and post-graduate planning (Sarokhani et al., 2013). Could friendships add to this negative mental health impact? Which friendship qualities are associated with mental illnesses? How do factors like cultural background, class year, and gender impact the effect of friendship qualities on one’s mental health?

Mental Health Conditions

Mental health disorders affect one’s mood, thinking, and behavior (Robins et al., 1981). This study does not diagnose participants with mental health disorders; however, it measures the prevalence of mental illnesses’ symptoms among participants. In this study, the symptoms of loneliness, social anxiety, and depression are measured. In addition, the study also measures for positive affect and well-being. It is important to study mental health because mental symptoms can influence our physical health, our productivity, our relationships with our friends and family, and our ability to have a long and happy life (Lin et al., 2003; Russ et al., 2012; Sarokhani et al., 2013). Furthermore, more than 66% of young adults do not seek help for their mental health problems (Castaldelli-Maia et al., 2012). This disparity could be attributed to cultural influences; for instance, in the Black community, stigma is the greatest barrier to seeking mental health
services (Ward and Heidrich, 2009). By navigating how friendship qualities impact mental health, researchers could learn more about how to mitigate the risk of mental health disorders.

**Depression.** Major Depressive Disorder (MDD) is a mood disorder that negatively influences how one acts, thinks, and behaves (Sarokhani et al., 2013). Depression symptoms vary from mild to severe and can include loss of interest in activities, changes in appetite, thoughts of death or suicide, and feelings of guilt. Depression among college students is especially important because there are various stressors during the transitionary period from adolescence to adulthood that impact students’ mental health (Sarokhani et al., 2013). Approximately 18% of college students have been diagnosed for depression, and 7% of college students have seriously contemplated suicide (Mackenzie et al., 2011). In 2016, suicide was the second-leading cause of death of college students (Centers for Disease Control and Prevention, 2016). This prevalence of depression symptoms has been associated with substance use among students, troubles with romantic relationships, and financial strains (Pedrelli et al., 2015).

**Loneliness.** Loneliness is the perception of isolation and being alone and the associated feelings and stress from this perceived disconnectedness (Hawkley and Cacioppo, 2010). Loneliness is primarily treated as a symptom of mental disorders (Tiwari, 2013). Its prevalence and health effects are comparable to those of obesity in America (Holt-Lunstad, Smith, & Layton, 2010; Holt-Lunstad et al., 2015). Although there is less research regarding loneliness among college students, compared with older adults, there have been several studies at American universities that documented the prevalence of loneliness among their students. According to University of Montana’s 2018 Health Report, 71% of their students reported feeling very lonely, and this percentage increased by 10% since 2012.
There are various factors influencing the risk of loneliness among college students, including social media use and the diversity of the student body. Primack et al. (2017) found that students who utilized social media more were more likely to feel socially isolated. Primack et al. (2017) explained that it is possible that constant social media use led to more consumption of idealized representations of a happy life, and these representations increased feelings of envy and isolation among students. A study by the Cooperative Institutional Research Program at the University of California, Los Angeles found that physical socialization among college friends has decreased and has been replaced with digital socialization on social media (Eagan et al., 2014). The study suggested that this reduction in physical socialization is associated with a decline in emotional health and an increase in loneliness. Furthermore, students from marginalized groups were more likely to feel lonely on college campuses due to lack of social support and belonging (Mounts et al. 2006). It is important to continue research on loneliness because it has threatening effects on both physical and mental health, such as heart disease, depression, and suicide (Holt-Lunstad et al., 2015).

**Social anxiety.** Social anxiety disorder (SAD), also known as social phobia, is characterized as an intense and constant fear of being negatively judged or rejected by others in a social environment (Purdon et al., 2001). SAD is a phobia disorder that tends to arise between adolescence and middle-adulthood (Schneier et al., 2006). There is not much data that quantifies the prevalence of SAD with college students in America, but research has shown that it is common with this population globally (Schry, Roberson-Nay, and White, 2012). In Schry et al.’s (2012) study with Canadian college students, the prevalence of SAD in the past-year was 7.95%, and the lifetime prevalence was 9.6%. Russell and Shaw (2009) concluded that 10% of college students within universities in the United Kingdom had extreme levels of SAD. In the University
of Garmian, Iraq, the prevalence of SAD among college students was more than 80% (Seidi, 2017). Pedrelli et al. (2015) found that roughly 11.9% of American college students were affected by anxiety. Females were found to be affected by SAD more compared with males. Furthermore, underclassmen -- freshmen and sophomores -- had greater vulnerabilities to SAD (Seidi, 2017).

SAD is especially important among college students because students encounter various social situations in which they are evaluated -- group projects, interviews, and presentations and these evaluations are often critical to their academic performance (Schry et al., 2012). Not only can the stress of academic performance influence the onset on SAD among students, but decreased academic performance can also be a consequence of SAD. It is important to investigate SAD among college students because students who experienced symptoms of SAD and met its diagnostic criteria were vulnerable to comorbid psychiatric disorders and psychosocial impairment (Filho et al., 2010). These students are also likely to cope with dangerous substances, like drugs and alcohol (Schry et al., 2012). Meta-analyses displayed that those who experienced SAD had an overall lower quality of life (Olantunji et al., 2007). Because these individuals are fearful of evaluation and social interactions, they are less likely to seek psychological services (Seidi, 2017).

**Positive affect and well-being.** Positive affectivity is associated with positive emotions and expressions, such as joy, enthusiasm, and cheerfulness (Figueira et al., 2018). These positive emotions are important to our well-being. Well-being is a subjective term that refers to the state of being satisfied and with pleasant affect (Dodge et al., 2012). Well-being is important to one’s overall health because promoted well-being decreases one’s susceptibility to physical illness and premature mortality (Stewart-Brown, 1998). Individuals who suffered from emotional distress
were more likely to utilize smoking, drinking, and unhealthy foods as a form of coping, and these actions worsened their health status (Cameron & Jones, 1985).

A study on a liberal arts college and a research institution found that ethnicity and social belongingness were important factors in obtaining well-being (Baldwin et al., 2017). For instance, Black males who attended a Historically Black College and University (HBCU) were more likely to score higher on measures of love and sense of control compared to Black males who attended Predominantly White Institutions (PWIs). Well-being is essential to balancing academic, social, financial, and health-related demands with college students.

**Friendship Qualities**

Friendship qualities are defined as features of a friendship, and these qualities are often categorized as being high and low (Berndt, 2002). A high-quality friendship is represented with great levels of intimacy, trust, and helpfulness. On the other hand, Berndt (2002) explained that a low-quality friendship is characterized with conflict, rivalry, and other negative features. In this study, the friendship qualities scaled questions measure for stimulating companionship, helpfulness, intimacy, reliable alliance, self-validation, and emotional security.

**Selectivity**

As adults age, their social connections and circles reduce, and they become more selective with who they interact with (Fredrickson and Carstensen, 1990). A reason for this behavior is to conserve both emotional and physical energy. As humans advance through life, their priorities and meanings of life change, and as a result, their criteria for friendship change (Pica and Verno, 2012). Carstensen et al., 1999 explained that a child’s friend may be someone who they can exchange toys with while an adult’s friend may be someone who provides
intimacy. This is related to Carstensen’s Socioemotional Selectivity Theory that suggests that as people age, they require closer and more emotionally fulfilling relationships (Pica and Verno, 2012).

**Social Support**

Humans are very social beings, and social connections and interactions are important aspects of life (Fredrickson and Carstensen, 1990). Social support describes not only the help that people receive from others but also their “sense of belonging to a family, group, or organization” (Hobfoll, 1996; p.47). Hobfoll (1996) explained that an important indicator of social support is the number of intimate supporters one has. Many studies have found inverse relationships between social support and mental illnesses (Harandi et al., 2017). For instance, Van Droogenbroeck et al. (2018) explained that adolescents with low-quality social support reported greater depression, anxiety, and distress.

**Relationship between Friendship Qualities and Mental Health**

**Friendship quantity vs. friendship quality.** Friendships are a type of social support. The quality of one’s social support (friendships, relationships, etc.) is more significant to one’s well-being than the quantity of interactions (Fiori, Antonucci, and Cortina, 2006). An increase in the number of social interactions does not necessarily mean that there will be an improvement in mental illness symptoms, as these interactions can be toxic. Fiori and colleagues (2006) investigated the impact of social relations on mental health among older, American adults and found that it is the quality of the interactions that is significant to the mental health outcomes of individuals. Social networks can have both detrimental and beneficial mental health impacts, depending on the interaction quality. According to Nguyen and colleagues (2015), the
“qualitative aspects” of social networks, such as the intimacy of contact, are more important than the “structural aspects,” such as the frequency of contact (p. 973). Positive social interactions with one friend could be more beneficial than negative interactions with fifty friends. It is important to note that although quantity is less important, completely avoiding social interactions and becoming socially isolated could also worsen mental health outcomes. There needs to be a healthy balance of social interactions.

Studying the qualities of social interactions affect mental health is imperative because many times people are under the impression that simply having people around them will help them heal, and that is not the case (Nguyen et al., 2015). In some situations, being surrounded by people could worsen one’s mental health because of the toxic characteristics that may be in their social networks.

**Friendship quality and mental health.** Bowker and Rubin (2009) examined the influence of friendship quality on self-compassion and internalizing problems on a mixed-gender group of 8th graders. Findings from this study revealed that the adolescents significantly reported more public self-consciousness than private self-consciousness. In addition, girls had more anxiety toward rejection than boys did. Girls also rated their friendships more positively than boys did. Furthermore, private self-consciousness was found to be strongly positively related to internalizing problems. There was a strong association between adolescents with high and medium levels of positive friendship quality and their social withdrawal and private self-consciousness. This relationship was not found among adolescents with low levels of positive friendship quality. Contrary to expectations, positive friendship quality may worsen some stressors associated with self-consciousness.
Additionally, Thomas and Daubman (2001) explored the relationship between friendship quality and self-esteem in teenage girls and boys (11th and 12th graders). The researchers found that among the teenage girls, there was a positive correlation with the quality of friendship and self-esteem with their cross-gender best friend. However, when it came to their same-gender best friend, there was no correlation with self-esteem and friendship quality. On the other hand, boys’ self-esteem did not correlate with friendship quality at all. This difference may be because girls found their friendships more interpersonally rewarding, stressful, and stronger than boys did. The researchers found that girls’ self-esteem was significantly lower than boys’, and this may be connected to the findings that girls tend to base their self-esteem on attractiveness, looks, and acceptance, while boys tend to value outperforming others. Consequently, girls used their relationships to define themselves, and this may be why friendship quality may influence their self-esteem more than boys.

Culture and identity affect the role of social networks on mental health. There are some cultures – mostly located in African, Asian, and South American countries – that are collective (Hofmann and Hinton, 2015). Collectivism, “an individual’s concern with the advancement of the group to which he or she belongs,” is an important aspect of several cultures, as members of these cultures tend to feel a connection for and responsibility of members of their community (Carson, 2009; p.327). Studies have found that the mental health of members of collective cultures has dependence on social networks. For instance, Black people benefit from interactions within their social networks, as it can help form their identity and purpose in society (Ajrouch et al., 2001) and predict lower levels of mental illness (Lindsey et al., 2010; Chatters et al., 2018). Social network is very important for Latinos experiencing mental distress, as family and friends are more trustworthy and accessible than professional healthcare providers (Villatoro et al.,
Similarly, a study by Guillory and Wolverton (2008) explained that it was important for Native American college students to create a sense of “family” away from home, as it helps reduce negative feelings associated with physically leaving their home. This “family” was composed of friends they made at college. The support not only helped their transition into college, but it impacted their ability to remain in college while dealing with external and internal stressors.

**What this Research Adds**

There are not many studies that analyze the link between friendship qualities and mental health conditions among college students. Many of the studies that explore social networks and mental health research the support of family and significant others more than friendship. For the studies that do research friendship support, the population of focus is among children, adolescents, or older adults. This study adds to the current research because it examines this link among college students, specifically Duke University undergraduates.

This is important because Duke University is an elite college with high performing students. Studies have shown that intelligent people have difficulties interacting with friends and tend to have fewer friends, compared with people with average intelligence (Laakasuo et al., 2016). It is important to study Duke students and mental disorders because they are in a perfectionist environment, and according to Shannon et al. (2018), perfectionistic individuals are not only more vulnerable to mental disorders, but they encounter more stigma against receiving help.

In addition, Duke is different from many colleges, and these differences may increase the dependence on friendship support. It is a private college, and it has a smaller student population compared with many public colleges. This may limit the amount or types of friends that Duke
students have. Furthermore, compared to state colleges, Duke tends to recruit students from more diverse communities, in terms of types of high schools, states, and countries. This is important because many students are leaving their home support. In state colleges, most of the student population is from that state. It may be easier for them to maintain home support, as they are physically closer to their home. Duke students tend to be physically further from their home support, and this may increase the need for friendship support on campus. Compared to other private and elite colleges, Duke has a significant athletic presence. For some students, this is important because it provides a way of building friendships, for example, attending games with friends or finding friends through a sports team. Athletic events also require a form of peer support among Duke students. For example, for students to attend the Duke-UNC home game, they need to tent outside with peers for several months during the winter. This event requires intensive communication and collaboration with peers, and it could either build friendships or strain them.

Among Duke students, there is a phenomenon of the “Duke Bubble” which is the idea that Duke students tend to remain on campus and not explore the surrounding Durham community. Duke has a wide range of restaurants on campus and brings in entertainment such as concerts and movie screenings, so some students find comfort in remaining on campus. As a result, students may not find friends or social support off campus, and this would increase the importance of social support among Duke students.

In summary, this research is important because it contributes to existing data by focusing on a unique and vulnerable population.
Hypothesis

I hypothesize that negative mental health conditions – depression, social anxiety, and loneliness – will inversely correlate with positive friendship qualities among close friendships with Duke University undergraduate students. In addition, I expect that students with better quality friendships will report lower conditions of negative mental health. Furthermore, I hypothesize that women will have a stronger relationship between friendship qualities and negative mental health conditions, compared with males. I expect that seniors will have stronger relationships between friendship qualities and mental health conditions because they become more selective and have deeper, more fulfilling relationships. I hypothesize that underrepresented minorities will have stronger relationships between friendship qualities and mental health conditions because social integration will be important for their performance and survival in college. Lastly, I believe that individuals with bigger friend groups will report less intimacy with their closest friend because they will be too occupied with their friend group.

Methods

Participants

There were 148 participants originally in this study, which was approved by the Duke University Health System Institutional Review Board. The participants were undergraduate students enrolled at Duke University during the 2018-2019 school year. There were no additional demographical restrictions or requirements to participate in the study.

Study Recruitment. The study, “Friendship and Mental Health,” was listed on the Psychology and Neuroscience Psychology Credit Research sign-up program at Duke University
(SONA). It was described as a mixed-methods study that analyzes the relationship between friendship qualities and mental health. Only students who required psychology credit in their classes had access to the survey on SONA. These students received 1 credit hour for their participation. Survey responses were initially collected through SONA for three weeks. At that time, 95.0% of the participants were either White or Asian, and only 9.0% were upperclassmen (juniors or seniors).

To increase racial diversity and expand the age range, additional recruitment strategies were employed. Participants were recruited through Duke University student group email listservs and social media groups to diversify the demographics. These listservs included the Cardea Fellows Program and Minorities Association of Premedical Students. The social media groups included Duke Amandla Chorus, and DukeAfrica. In the email listservs and social media groups, there was a description of the survey along with its link, and the recruited participants were compensated with a $10 Amazon gift card. Most of the participants, 74.5%, were recruited through Sona.

**Materials and Procedure**

Data for this project were gathered through an online survey administered through Qualtrics. To clarify, students did not have to physically come to a specific location to take the survey. The participants accessed the survey through Sona or the listservs. The online survey consisted of short essay questions, multiple choice questions, and likert-type scale questions. The positive friendship qualities scaled questions (measuring for stimulating companionship, help, intimacy, reliable alliance, self-validation, and emotional security) were fully adapted from the McGill Friendship Questionnaire- Friendship Functions (MFQ-FF), and the questions measuring for mental health were fully adapted from the PROMIS depression, Severity Measure for Social
Anxiety Disorder - Adult, PROMIS Positive Affect and Well-Being, and UCLA loneliness scales. Questions that measured negative friendship qualities were also utilized.

**McGill Friendship Questionnaire- Friendship Functions (MFQ-FF).** This 48-item measure was developed as part of a research study to assess the extent to which an individual's friend fulfills six positive friendship functions: stimulating companionship, help, intimacy, reliable alliance, self-validation, and emotional security at McGill University (Mendelson and Aboud, 1999). For this study, participants answered regarding their closest friend at Duke, and these questions can be found in Appendix A. There were 8 questions for each friendship function. The questions had a blank line, to visually represent the friend who they were answering about, followed by a measuring description. For example, “___ is fun to do things with” was a question measuring the degree of Stimulating Companionship in the friendship. Participants responded on a 9-point scale (0-8), where five of the points were labeled (0 = never, 2 = rarely, 4 = once in a while, 6 = fairly often, 8 = always). Higher responses indicated that the friend fulfilled more of that friendship quality. Prior studies with college students have demonstrated that this measure has high validity and reliability, with a Cronbach’s alpha of .97 (Mendelson and Aboud, 1999).

*Stimulating Companionship* indicates the quality of the time that friends spend together while participating in pleasurable activities. *Help* indicates a friend’s assistance through providing information and guidance (“___ shows me how to do things better“). *Intimacy* indicates how sensitive, understanding, and trusting a friend is with confiding and self-disclosure (“___ is someone I can tell secrets to“). *Reliable Alliance* indicates that a friend is loyal and dependable (“___ would stay my friend even if other people criticized me“). *Self-validation* indicates a friend’s contribution in motivating a positive self-image and being accessible to listen
and encourage (“___ makes me feel special “). Emotional Security indicates the reassurance that a friend provides to protect their friend in threatening situations (“___ makes me feel better when I’m upset “).

**Negative Friendship Qualities.** This 9-item measure was developed by through discussions in the Duke University Eating Disorder Research Laboratory and analysis of other friendship questionnaires. The items assess the following qualities: demandingness, conflict resolution ease, conflict resolution frequency, dishonesty, competitiveness, and superficiality, and these questions can be found in Appendix B. The items were scored on a sliding scale of 0 – 100. Higher scores indicated that their closest friend displayed more of those negative qualities. Five of the items were reverse scored. A Cronbach’s alpha score of .755 demonstrates that this measure has internal consistency and reliability.

**NIH PROMIS© Positive Affect and Well-Being.** This 23-item measure assess self-reported symptoms of positive affect and well-being, such as feelings associated with happiness, contentment, affection, engagement, and pleasure. Responses ranged from 1 (“Never”) to 5 (“Always”), and higher scores indicated greater feelings of positive affect. Prior clinical studies with adults have demonstrated that this measure has good reliability. For instance, its Cronbach’s alpha internal consistency reliability was reported as .977 (Cella et al., 2016)

**NIH PROMIS© Emotional Distress - Depression.** This 28-item measure was developed as part of the patient-reported outcome assessment measure resource developed by the National Institute of Health. It assesses self-reported symptoms of depression over a 7-day period and responses range from 1 (“Never”) to 5 (“Always”). Higher scores indicated more symptoms of depression, such as negative mood, negative views of the self, negative social cognition, and decreased positive affect (Levin et al., 2015). Prior clinical studies with adults have demonstrated
that this measure has good convergent and discriminant validity and reliability, as it significantly correlated with the Perceived Stress Scale (r = .68) and the Beck Depression Index II (r = .69) (Morgan et al., 2013). It has been reported to have a Cronbach’s alpha score of .93 (Kroenke et al., 2014).

**UCLA Loneliness Scale.** This 20-item scale measures participant’s personal feelings of loneliness and social isolation. The instructions suggest that participants rate how statements relating to loneliness and social isolation describe their feelings. There are four labels (1 = never, 2 = rarely, 3 = sometimes, 4 = often). For most (11) of the items, higher responses indicated that the participant reported greater symptoms of loneliness. Nine of the items were reversed scored, and lower responses indicated that the participant reported greater symptoms of loneliness. This measure has high internal consistency (coefficient alpha = .96) (Russel et al., 1978). Through a study that included a sample of college students, Russell (1996) found the UCLA Loneliness Scale was highly reliable with internal consistency (coefficient alpha ranging from .89 to .94) and test-retest reliability (r = .73). Construct validity and convergent validity were indicated by significant correlations with other measures of loneliness and interpersonal relationships (Russell, 1996).

**Severity Measure for Social Anxiety Disorder (Social Phobia) - Adult.** This 10-item measure assesses self-reported symptoms of SAD among adults over a 7-day period. Responses range from 0 (“Never”) to 4 (“All of the time”) (Craske et al, 2013). Higher scores indicated more symptoms of SAD, such as physical symptoms associated with anxiety and avoidance of social situations. Prior clinical studies with adults have demonstrated that this measure has good reliability and convergent and discriminant validity (LeBeau et al., 2016). Internal consistency was high with a Cronbach’s alpha score of .86. This measure significantly correlated with fear
and avoidance scores ($r = .5$, $p<0.01$). There was a non-significant relationship between this measure and the MASQ depression subscale ($r = .3$, $p<0.05$).

**Other Questions.** There were qualitative questions that asked about students’ general friendships, such as questions about positive and negative characteristics of their friends, how they navigated friendships during their freshman year, and how upperclassmen’s friendship requirements may have changed. These questions had a paragraph box on Qualtrics, where participants could write as much as they wanted. These questions were constructed through discussions in research lab meetings. Demographic questions, such as race, ethnicity, class year, and gender were analyzed.

**Survey Instructions.** Participants were advised to complete the entire survey in one sitting. They were also encouraged against sharing identifiable information about their friends. To help guide participants’ responses, close friends were described as those who stand out among one’s friendships and do not have to be one’s best friend or the friend that they like most; however, these friends have much influence on them through their many interactions.

**Data Analysis.** To review, I primarily hypothesized that negative mental health conditions – depression, social anxiety, and loneliness – will inversely correlate with positive friendship qualities among close friendships with Duke University undergraduate students. In addition, I expect that students with better quality friendships will report lower conditions of negative mental health. Furthermore, I hypothesize that women will have a stronger relationship between friendship qualities and negative mental health conditions, compared with males. I expect that seniors and underrepresented minorities will have stronger relationships between friendship qualities and mental health conditions. Lastly, I believe that individuals with bigger friend groups will report less intimacy with their closest friend. To navigate these hypotheses, I
distributed an online survey to Duke University undergraduate students and analyzed the data using correlations and regression models through R studio and SPSS.

The following composite variables were used in the analysis: Negative Outcomes (standardized composite score of depression, social anxiety, and loneliness); Positive Friendship Qualities (standardized composite score of subscales measuring emotional security, reliable alliance, intimacy, help, stimulating companionship, and self-validation); and Negative Friendship Qualities (standardized composite score of questions measuring demandingness, conflict resolution ease, conflict resolution frequency, dishonesty, competitiveness, and superficiality). These composite scores were created by following the suggested scoring methods on the measures’ and through adaptations of previous studies that used them. The Negative Friendship Quality composite was created by summing the scores of the subscales across participants.

Results

Data Exclusion

Three participants did not answer any of the friendship quality, depression, anxiety, loneliness, and positive affect questions, so their responses were removed. One participant did not answer any of the positive affect questions, and one participant did not answer any of the depression questions. Their responses were removed. One participant skipped 23 questions, and their responses were removed. Lastly, although one participant answered all the questions, she answered them about a friend who does not attend Duke, and the instructions were to answer about one’s closest friend at Duke. Her responses were also removed. There were 196 questions, and all the remaining participants answered at least 95% of them. The final sample size for this study was 141.
Demographics

Most of the participants were underclassmen, as 46.1% of them were freshmen, 24.8% were sophomores, 19.1% were juniors, and 10.0% were seniors. The gender breakdown of the participants were 75.2% females and 24.8% males. The racial demographics were as followed: 38.3% White/Caucasian, 32.0% Asian/Pacific Islander, 23.4% Black, 6.4% Hispanic or Latino, 1.4% Native American or American Indian, and 2.8% multiracial. Participants were given the option to select more than one racial group. 11.3% of participants were international students, 2.8% took a gap year before matriculating to college, and 1.4% were transfer students.

Extracurricular data were also collected; 20.6% of them were involved in a Greek sorority or fraternity group; 18.4% of the participants were involved in an athletic team; 16.3% were involved in a Selective Living Group (SLG); 9.2% participated in a performing arts group. Participants were given the option to select multiple extracurricular activities. 65.3% of the participants were not in a romantic relationship while 27.1% of them claimed that they were in one; 7.6% of participants suggested that their relationship status is “complicated.” 50.3% of participants shared that their household income is greater than $100,000; 31.1% shared that their household income is less than $100,000; 12.4% did not know; and 6.2% preferred not to answer.

Friendship Qualities and Mental Health

Several multiple linear regression models with depression, loneliness, social anxiety, and positive affect as the dependent variable and Positive Friendship Qualities (M=356.56) and Negative Friendship Qualities (M = 177.44) as the independent variables were conducted to achieve these results. To clarify, four regression tests were conducted, as PFQ and NFQ were both independent variables in each model.
Statistics and Correlations with Friendship Qualities and Mental Health Conditions.

Table 1 displays the ranges, medians, and modes of the friendship qualities and mental health conditions. The correlations between the mental health conditions are also displayed. Positive affect was inversely correlated with depression, loneliness, and social anxiety. The negative mental health conditions were directly correlated with each other. The strongest correlations were between positive affect and depression, and the weakest correlations were between positive affect and social anxiety.

Table 1: Descriptive Data of Friendship Qualities and Mental Health Conditions

<table>
<thead>
<tr>
<th>Variable</th>
<th>Range (difference)</th>
<th>Median</th>
<th>Mode (frequency)</th>
<th>R with Depression</th>
<th>R with Loneliness</th>
<th>R with Social Anxiety</th>
<th>R with Positive Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression</td>
<td>27 – 139 (112)</td>
<td>53</td>
<td>34 (6x)</td>
<td>.729</td>
<td>.689</td>
<td>-.844</td>
<td></td>
</tr>
<tr>
<td>Loneliness</td>
<td>12 – 62 (50)</td>
<td>25</td>
<td>22 (10x)</td>
<td>.729</td>
<td>.640</td>
<td>-.689</td>
<td></td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>11 – 54 (43)</td>
<td>17</td>
<td>13, 11 (17x)</td>
<td>.688</td>
<td>.640</td>
<td>-.601</td>
<td></td>
</tr>
<tr>
<td>Positive Affect</td>
<td>26 – 115 (89)</td>
<td>91</td>
<td>92 (12x)</td>
<td>-.844</td>
<td>-.689</td>
<td>-.601</td>
<td></td>
</tr>
<tr>
<td>PFQ</td>
<td>135 – 405 (270)</td>
<td>367</td>
<td>405 (13x)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NFQ</td>
<td>0 – 483 (483)</td>
<td>155</td>
<td>70, 105, 30, 81 (3x)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regressions and Correlations between Friendship Qualities and Mental Health.

Analysis of the collected data displayed that among Duke undergraduates, PFQ was a significant predictor of the mental health conditions (Table 2) while NFQ was not a significant predictor (Table 3). The negative mental health conditions had an inverse relationship with PFQ, and positive affect had a direct relationship with PFQ. Similarly, the negative mental health conditions had a direct relationship with NFQ, and positive affect had an inverse relationship with NFQ. These results support my primary hypothesis. Depression responses had the most
variation followed by positive affect, loneliness, and social anxiety. When correlated with PFQ, loneliness displayed the greatest strength, followed by positive affect, depression, and social anxiety. When correlated with NFQ, loneliness had the greatest strength, followed by depression, social anxiety, and positive affect. The correlations between PFQ and the mental health conditions were all stronger than the correlations between NFQ and the mental health conditions. Because NFQ was not a significant predictor of mental health conditions, it will not be used to analyze the following relationships between friendship qualities and mental health conditions among gender, class year, and racial representation groups.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loneliness</td>
<td>26.64</td>
<td>9.689</td>
<td>-.103</td>
<td>-.479</td>
<td>-5.782</td>
<td>.000***</td>
<td>-.529</td>
</tr>
<tr>
<td>Depression</td>
<td>55.84</td>
<td>22.998</td>
<td>-.171</td>
<td>-.0331</td>
<td>-3.725</td>
<td>.000***</td>
<td>-.381</td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>19.23</td>
<td>8.131</td>
<td>-.050</td>
<td>-.273</td>
<td>-3.007</td>
<td>.003**</td>
<td>-.327</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>88.13</td>
<td>19.069</td>
<td>.164</td>
<td>.381</td>
<td>4.322</td>
<td>.000***</td>
<td>.407</td>
</tr>
</tbody>
</table>

Note: *p < 0.05; ** p < 0.01, *** p < 0.001

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loneliness</td>
<td>26.64</td>
<td>9.689</td>
<td>.011</td>
<td>.124</td>
<td>1.525</td>
<td>.13</td>
<td>.347</td>
</tr>
<tr>
<td>Depression</td>
<td>55.84</td>
<td>22.998</td>
<td>.022</td>
<td>.104</td>
<td>1.166</td>
<td>.246</td>
<td>.261</td>
</tr>
<tr>
<td>Social Anxiety</td>
<td>19.23</td>
<td>8.131</td>
<td>.008</td>
<td>.114</td>
<td>1.253</td>
<td>.212</td>
<td>.243</td>
</tr>
<tr>
<td>Positive Affect</td>
<td>88.13</td>
<td>19.069</td>
<td>-.009</td>
<td>-.055</td>
<td>-.618</td>
<td>.537</td>
<td>-.235</td>
</tr>
</tbody>
</table>
Which Friendship Quality?

Regression of Individual PFQ with Negative Outcomes

A multiple linear regression was conducted with Negative Outcomes (M = 101.70, SD = 37.04) as the dependent variable and emotional security (M = 62.52), reliable alliance (M = 56.75), intimacy (M = 63.48), help (M = 54.47), stimulating companionship (M = 64.75), and self-validation (M = 54.59) as the independent variables (Table 4). Among the six positive friendship qualities, only reliable alliance (M= 56.75), F (6, 134) = 7.419, p < 0.01 was a significant predictor. All the positive friendship qualities were negatively correlated with Negative Outcomes. Reliable alliance had the strongest relationship (r = -.464), and stimulating companionship had the weakest relationship (r = -.304).

Table 4: Regression of Individual Positive Friendship Qualities with Negative Outcomes

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>B</th>
<th>β</th>
<th>t</th>
<th>p</th>
<th>Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulating Companionship</td>
<td>64.75</td>
<td>7.281</td>
<td>.342</td>
<td>.067</td>
<td>.623</td>
<td>.534</td>
<td>-.304</td>
</tr>
<tr>
<td>Help</td>
<td>54.47</td>
<td>8.095</td>
<td>-1.024</td>
<td>-.224</td>
<td>-1.864</td>
<td>.065</td>
<td>-.411</td>
</tr>
<tr>
<td>Intimacy</td>
<td>63.48</td>
<td>9.992</td>
<td>.361</td>
<td>.097</td>
<td>.810</td>
<td>.420</td>
<td>-.321</td>
</tr>
<tr>
<td>Reliable Alliance</td>
<td>56.75</td>
<td>7.006</td>
<td>-1.653</td>
<td>-.313</td>
<td>-2.755</td>
<td>.007**</td>
<td>-4.64</td>
</tr>
<tr>
<td>Self-Validation</td>
<td>54.59</td>
<td>9.178</td>
<td>-0.047</td>
<td>-.012</td>
<td>-.081</td>
<td>.936</td>
<td>-.378</td>
</tr>
<tr>
<td>Emotional Security</td>
<td>62.52</td>
<td>10.650</td>
<td>-0.504</td>
<td>-.145</td>
<td>-1.006</td>
<td>.316</td>
<td>-.412</td>
</tr>
</tbody>
</table>

Note: *p < 0.05; ** p < 0.01

Regression of Individual PFQ with Positive Affect

A multiple linear regression model was conducted with positive affect (M= 88.13, SD = 19.07) as the dependent variable and emotional security, reliable alliance, intimacy, help, stimulating companionship, and self-validation as the independent variables (Table 5). There were no significant predictors. Although not significant, reliable alliance (M= 56.75), F (6, 134)
= 5.202, \( p < 0.01 \) had the strongest correlation (\( r = .394 \)), and intimacy had the weakest (\( r = .287 \)). In addition, reliable alliance’s p-value (\( p = .07 \)) was close to the cutoff (\( p = .05 \)) and lower than the other qualities. All the positive friendship qualities were positively correlated with positive affect. Compared with the individual friendship qualities’ correlations with Negative Outcomes, the correlations with positive affect decreased for each friendship quality.

**Table 5: Regression of Individual Positive Friendship Qualities with Positive Affect**

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>B</th>
<th>( \beta )</th>
<th>t</th>
<th>( p )</th>
<th>Pearson Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stimulating Companionship</td>
<td>64.75</td>
<td>7.281</td>
<td>-.012</td>
<td>-.005</td>
<td>-.040</td>
<td>.968</td>
<td>.303</td>
</tr>
<tr>
<td>Help</td>
<td>54.47</td>
<td>8.095</td>
<td>.367</td>
<td>.156</td>
<td>1.247</td>
<td>.215</td>
<td>.359</td>
</tr>
<tr>
<td>Intimacy</td>
<td>63.48</td>
<td>9.992</td>
<td>-.181</td>
<td>-.095</td>
<td>-.761</td>
<td>.448</td>
<td>.287</td>
</tr>
<tr>
<td>Reliable Alliance</td>
<td>56.75</td>
<td>7.006</td>
<td>.587</td>
<td>.216</td>
<td>1.829</td>
<td>.070</td>
<td>.394</td>
</tr>
<tr>
<td>Self-Validation</td>
<td>54.59</td>
<td>9.178</td>
<td>.218</td>
<td>.105</td>
<td>.704</td>
<td>.483</td>
<td>.368</td>
</tr>
<tr>
<td>Emotional Security</td>
<td>62.52</td>
<td>10.650</td>
<td>.182</td>
<td>.102</td>
<td>.680</td>
<td>.498</td>
<td>.373</td>
</tr>
</tbody>
</table>

**The Influence of Gender**

Bivariate correlations were utilized in this analysis. Note that there were much more female participants in this study (N= 106) compared with males (N = 35).

**Average and Variation Trends among Class Year.** On average, women reported higher PFQ, depression, social anxiety, and loneliness (Table 6). Men reported higher averages of positive affect and lower averages of PFQ, depression, social anxiety, and loneliness. Compared with men, there was more variation in all the women’s responses.
Table 6: Means and Standard Deviations of PFQ and Mental Health Conditions, Gender

<table>
<thead>
<tr>
<th>Class Year</th>
<th>μ (SD) - PFQ</th>
<th>μ (SD) – Positive Affect</th>
<th>μ (SD) – Depression</th>
<th>μ (SD) – Social Anxiety</th>
<th>μ (SD) – Loneliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men (N=35)</td>
<td>352.94 (36.877)</td>
<td>91.74 (15.758)</td>
<td>50.03 (18.053)</td>
<td>17.43 (5.987)</td>
<td>24.89 (7.415)</td>
</tr>
<tr>
<td>Women (N =106)</td>
<td>357.75 (46.777)</td>
<td>86.94 (19.966)</td>
<td>57.75 (24.181)</td>
<td>19.82 (8.666)</td>
<td>27.22 (10.296)</td>
</tr>
</tbody>
</table>

Correlations among Gender. Like the patterns displayed earlier, there were inverse relationships between friendship qualities and the negative mental health conditions among the genders (Table 7). All the correlations between PFQ and mental health conditions were significant among women. Only the correlation with social anxiety was significant among men, and the correlation’s p-value was still greater than that of women. Except with social anxiety, all the correlations were stronger among women. Figure 1 displays these results in a graph.

Table 7: Correlational Data of PFQ and Mental Health Conditions, Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>R (p-value) with Positive Affect</th>
<th>R (p-value) with Depression</th>
<th>R (p-value) with Social Anxiety</th>
<th>R (p-value) with Loneliness</th>
<th>R with NFQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men (N=35)</td>
<td>.279 (.105)</td>
<td>-.207 (.232)</td>
<td>-.406* (.016)</td>
<td>-.327 (.055)</td>
<td>-.478**</td>
</tr>
<tr>
<td>Women (N=106)</td>
<td>.442** (.000)</td>
<td>-.427** (.000)</td>
<td>-.324** (.000)</td>
<td>-.577**(.000)</td>
<td>-.484**</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Class Year

In the survey, participants selected their college class year – freshman, sophomore, junior, and senior. To identify how class year influences the relationship between friendship qualities and mental health conditions, the participants’ data were analyzed using bivariate correlations. Each class year’s Positive Friendship Qualities score was correlated independently with depression, loneliness, social anxiety, and positive affect. Note that the samples sizes of the class years were not balanced. The number of participants decreased as the class year advanced: freshmen (N = 65), sophomore (N = 35), junior (N = 27), and senior (N = 14).

Average and Variation Trends among Class Year. On average, seniors reported higher Positive Friendship Qualities (M = 383.14), followed by freshmen (M = 354.32), juniors (M = 352.60), and lastly, sophomores (M = 352.60) (Table 8). There was more variation in the PFQ responses among freshmen. Seniors reported the greatest positive affect and the lowest
depression and loneliness. Freshmen reported the lowest social anxiety. On average, juniors reported the lowest positive affect and the greatest depression, social anxiety, and loneliness. There was more variation in the mental condition responses among juniors – with positive affect, depression, and loneliness.

**Table 8: Means and Standard Deviations of PFQ and Mental Health Conditions, Years**

<table>
<thead>
<tr>
<th>Class Year</th>
<th>( \mu ) (SD) - PFQ</th>
<th>( \mu ) (SD) – Positive Affect</th>
<th>( \mu ) (SD) – Depression</th>
<th>( \mu ) (SD) – Social Anxiety</th>
<th>( \mu ) (SD) – Loneliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshmen</td>
<td>354.32 (50.864)</td>
<td>92.72 (16.763)</td>
<td>52.57 (22.450)</td>
<td>18.54 (7.479)</td>
<td>26.31 (9.697)</td>
</tr>
<tr>
<td>Sophomores</td>
<td>352.60 (40.717)</td>
<td>83.46 (17.557)</td>
<td>56.86 (19.668)</td>
<td>19.51 (8.280)</td>
<td>26.60 (9.063)</td>
</tr>
<tr>
<td>Juniors</td>
<td>353.30 (36.413)</td>
<td>80.11 (22.575)</td>
<td>64.67 (26.134)</td>
<td>20.37 (9.009)</td>
<td>29.93 (10.855)</td>
</tr>
<tr>
<td>Seniors</td>
<td>383.14 (26.489)</td>
<td>94.00 (19.291)</td>
<td>51.43 (24.456)</td>
<td>19.50 (9.460)</td>
<td>21.93 (7.119)</td>
</tr>
</tbody>
</table>

**Correlations among Class Year.** Like the patterns displayed earlier, there were inverse relationships between friendship qualities and the negative mental health conditions for each class year (Table 9). The results of the analysis illustrated that all the correlations between friendship qualities and mental health conditions were significant among freshmen participants. Correlations between positive affect and PFQ were strongest among freshmen and weakest among sophomores. Correlations between depression and PFQ were strongest among seniors and weakest among sophomores. Correlations between social anxiety and PFQ were strongest among freshmen and weakest among juniors. Correlations between loneliness and PFQ were strongest among sophomores and weakest among seniors. Figure 2 displays these correlations in a graph.
Table 9: Correlational Data of PFQ and Mental Health Conditions, Years

<table>
<thead>
<tr>
<th>Class Year</th>
<th>R (p-value) with Positive Affect</th>
<th>R (p-value) with Depression</th>
<th>R (p-value) with Social Anxiety</th>
<th>R (p-value) with Loneliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Freshmen</td>
<td>.495** (.000)</td>
<td>-.484** (.000)</td>
<td>-.440** (.000)</td>
<td>-.539** (.000)</td>
</tr>
<tr>
<td>Sophomores</td>
<td>.230 (.184)</td>
<td>-.208 (.230)</td>
<td>-.318 (.063)</td>
<td>-.569** (.000)</td>
</tr>
<tr>
<td>Juniors</td>
<td>.447* (.019)</td>
<td>-.285 (.149)</td>
<td>-.127 (.529)</td>
<td>-.486* (.010)</td>
</tr>
<tr>
<td>Seniors</td>
<td>.491 (.074)</td>
<td>-.505 (.065)</td>
<td>-.362 (.204)</td>
<td>-.312 (.277)</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

Figure 2

Correlation between PFQ and Mental Outcomes by Class Year

* \( p < 0.05 \); ** \( p < 0.01 \)
Race

In the survey, participants selected their racial identities. To investigate how racial representation influences the relationship between friendship qualities and mental health conditions, I divided the participants’ responses into White (N = 54), Minority (N = 42), and Asian (N = 45) racial groups. Black, Native-American, Hispanic/Latinx, and multiracial participants made up the Minority group. The rationale of why these groups were divided this way is explained in the discussion. These data were analyzed using bivariate correlations. Like the patterns displayed earlier, there were inverse relationships between friendship qualities and mental health conditions for each racial group.

Average and Variation Trend among Racial Representation Groups. On average, Minority students reported the highest Positive Friendship Qualities, followed by Asian and White students respectively (Table 1). Variance of PFQ was highest among White students. On average, White students reported the highest positive affect. Minority students reported the lowest depression, social anxiety, and loneliness. Asian students reported the lowest average of positive affect and the highest averages of depression, social anxiety, and loneliness. Asian students also had the least variation among their mental health condition responses while White students had the most variation among their negative mental health condition responses.

Table 1: Means and Standard Deviations of PFQ and Mental Health Conditions, Race

<table>
<thead>
<tr>
<th>Group</th>
<th>μ (SD) - PFQ</th>
<th>μ (SD) – Positive Affect</th>
<th>μ (SD) – Depression</th>
<th>μ (SD) – Social Anxiety</th>
<th>μ (SD) – Loneliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (N = 54)</td>
<td>347.74 (53.592)</td>
<td>90.67 (19.357)</td>
<td>53.96 (24.449)</td>
<td>19.30 (9.338)</td>
<td>27.00 (10.944)</td>
</tr>
<tr>
<td>Minority (N = 42)</td>
<td>373.71 (30.208)</td>
<td>88.81 (20.664)</td>
<td>53.62 (23.313)</td>
<td>18.02 (7.965)</td>
<td>24.86 (9.348)</td>
</tr>
<tr>
<td>Asian (N = 45)</td>
<td>351.13 (39.622)</td>
<td>84.47 (16.903)</td>
<td>60.16 (16.903)</td>
<td>20.27 (6.611)</td>
<td>27.87 (8.262)</td>
</tr>
</tbody>
</table>
Correlations among Racial Representation Groups. Technically, all the correlations between PFQ and the mental health conditions were significant only among Minority students (Table 11), as the p-value of social anxiety did not make the cutoff for White and Asian students. However, the White and Asian students’ p-values for social anxiety are marginally significant, so it can be suggested that there is correlational significance among all the racial groups. Minority students’ correlations had the lowest p-value and the greatest strength with all the mental health conditions. White students had the weakest correlational strength with positive affect, depression, and social anxiety. Asian students had the weakest correlation with loneliness; however, their correlation was still moderate.

Table 11: Correlational Data of PFQ and Mental Health Conditions, Race

<table>
<thead>
<tr>
<th>Group</th>
<th>R (p-value) with Positive Affect</th>
<th>R (p-value) with Depression</th>
<th>R (p-value) with Social Anxiety</th>
<th>R (p-value) with Loneliness</th>
<th>R with NFQ</th>
</tr>
</thead>
<tbody>
<tr>
<td>White (N = 54)</td>
<td>.374** (.005)</td>
<td>-.372** (.006)</td>
<td>-.266 (.052)</td>
<td>-.514** (.000)</td>
<td>-.543**</td>
</tr>
<tr>
<td>Minority (N = 42)</td>
<td>.524** (.000)</td>
<td>-.455** (.002)</td>
<td>-.502** (.001)</td>
<td>-.662** (.000)</td>
<td>-.537**</td>
</tr>
<tr>
<td>Asian (N = 45)</td>
<td>.480** (.001)</td>
<td>-.380** (.010)</td>
<td>-.294 (.050)</td>
<td>-.452** (.002)</td>
<td>-.294</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).

Independent Sample Tests among Racial Representation Groups. Independent sample tests were conducted to explore differences in Positive Friendship Qualities among racial groups (Table 12). There were significant differences between White and Minority students and between Asian and Minority students. There were no significant differences between Asian and White students. Although not displayed in the results, independent sample tests were conducted to explore differences in mental health conditions among racial groups, and there were no differences.
Table 12: Independent Sample Tests of PFQ, Race

<table>
<thead>
<tr>
<th>Groups</th>
<th>Sig (2-tailed)</th>
<th>t</th>
<th>Mean Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>White and Asian</td>
<td>.719</td>
<td>.362</td>
<td>3.393</td>
</tr>
<tr>
<td>Minority and Asian</td>
<td>.004</td>
<td>-3.001</td>
<td>-22.581</td>
</tr>
<tr>
<td>Minority and White</td>
<td>.004</td>
<td>-3.001</td>
<td>-25.974</td>
</tr>
</tbody>
</table>

**Friend Group Size**

In the survey, participants were asked if they had at least one friend group at Duke, and if they did have one, they entered the number of people in their closest friend group. The sizes of friend groups ranged from 0 – 30 people with 5 being the median and mode (reported 22 times). Intimacy scores ranged from 16 to 72 with a median of 66. To investigate how friend group sizes influence intimacy quality with one’s closest friend, the friend groups were divided into None (participants who said that they did not have a friend group, N = 11), Small (participants who had 2- 4 friends in their friend group, N = 39), Medium (participants who had 5 - 9 friends in their friend group, N= 67), and Large (participants who had more than 10 friends in their friend group, N = 23). The explanation for why the group sizes were divided like this is in the discussion. These data were analyzed using bivariate correlations between intimacy, positive affect, and Negative Outcomes. Because the hypothesis for group size did not involve the correlation between friendship qualities and mental health, I used the composite score of Negative Outcomes instead of the individual negative mental health outcomes in the analysis.

On average, students without a friend group reported the lowest intimacy score, followed by those with a Medium, Small, and Large friend group respectively (Table 13). The averages of positive affect followed this same order. On the other hand, those with a Large friend group reported the lowest average of Negative Outcomes, followed by Small, Medium, and None
groups. Participants in the None group had the most variance across intimacy, positive affect, and Negative Outcomes responses.

Table 13: Means and Standard Deviations of Intimacy, Positive Affect, and Negative Outcomes, Size

<table>
<thead>
<tr>
<th>Group</th>
<th>μ – Intimacy</th>
<th>SD – Intimacy</th>
<th>μ – Positive Affect</th>
<th>SD – Positive Affect</th>
<th>μ – Negative Outcomes</th>
<th>SD – Negative Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (0)</td>
<td>56.64</td>
<td>18.640</td>
<td>79.27</td>
<td>31.607</td>
<td>126.73</td>
<td>65.859</td>
</tr>
<tr>
<td>Small (2-4)</td>
<td>66.10</td>
<td>7.272</td>
<td>90.77</td>
<td>15.433</td>
<td>97.08</td>
<td>32.354</td>
</tr>
<tr>
<td>Medium (5-9)</td>
<td>62.27</td>
<td>9.275</td>
<td>86.84</td>
<td>18.671</td>
<td>102.93</td>
<td>33.903</td>
</tr>
<tr>
<td>Large (&gt;9)</td>
<td>66.17</td>
<td>8.820</td>
<td>91.52</td>
<td>18.253</td>
<td>94.30</td>
<td>32.976</td>
</tr>
</tbody>
</table>

The Large group had the strongest correlations between intimacy, positive affect, and Negative Outcomes followed by Small, Medium, and None groups respectively (Table 14). The None group’s intimacy correlations with the mental health conditions were extremely weak. The Small group had the greatest significant correlations, as its p-values were smaller. Large and Medium groups had smaller correlational significance, respectively. All the groups had an inverse relationship between Negative Outcomes and Intimacy. The None group was the only group to have an inverse relationship between positive affect and intimacy.

Table 14: Correlational Data of Composite Mental Health Conditions and Intimacy

<table>
<thead>
<tr>
<th>Group</th>
<th>Pearson Correlation with Negative Outcomes</th>
<th>Pearson Correlation with Positive Affect</th>
<th>p-value – Negative Outcomes</th>
<th>p-value – Positive Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>None (0)</td>
<td>-.021</td>
<td>-.012</td>
<td>.952</td>
<td>.972</td>
</tr>
<tr>
<td>Small (2-4)</td>
<td>-.423**</td>
<td>.447**</td>
<td>.007</td>
<td>.004</td>
</tr>
<tr>
<td>Medium (5-9)</td>
<td>-.306*</td>
<td>-.247*</td>
<td>.012</td>
<td>.044</td>
</tr>
<tr>
<td>Large (&gt;9)</td>
<td>-.524*</td>
<td>.498*</td>
<td>.010</td>
<td>.016</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Discussion

Friendship Qualities and Mental Health

My hypothesis that there would be an inverse relationship between friendship quality and negative mental health conditions was supported. In addition, my hypothesis that friendship quality would be a significant predictor of mental health conditions was supported, as Positive Friendship Qualities significantly predicted loneliness, depression, social anxiety, and positive affect. These results align with the existing research of friendship qualities and mental health conditions.

Because I asked participants to answer about their closest friend at Duke, I expected most responses to have high PFQ. I expected the mental health conditions to be varied, as many things influence mental health conditions. There were 3 outliers (2 standard deviations away from the mean) among the Negative Outcomes scores. These individuals reported the highest Negative Outcomes, and I contemplated taking their data out (because they were outliers), but after reading the qualitative responses, I kept them. The first question in the survey was “Describe your general friendships at Duke;” these were the responses of the outliers (in order of descending Negative Outcomes score):

1. “I am freshman at Duke, and I have yet to make any true friendships here. I am friendly with my roommate because we spend so much time together, and there are people in my classes I talk to but I would never voluntarily hang out with. I feel as if I do not belong in the Duke community. I am considering transferring.”

2. “Only one friend at Duke and one close acquaintance.”

3. “slightly superficial.”
These participants all shared the fact that they do not have many fulfilling friendships at Duke. The participant from the first quote stood out to me, and because I will refer to this participant several times in the discussion, and I will refer to them as “Transfer Participant.” The participant from the second quote was a transfer student. In addition to the results, these quotes support the idea that social networks and support are important for maintaining mental health (Harandi et al., 2017). College students leave their home support and enter college, which has various types of stressors. They need social support to survive, and this can be found through friendships (Hefner and Eisenberg, 2009).

Reliable Alliance was the most significant predictor of mental health conditions. When one deals with stressful life events, it is important to have someone to rely on, as social support contributes to better mental health outcomes (Fiori, Antonucci, and Cortina, 2006).

**Gender**

My hypothesis that relationships between friendship qualities and mental health would be more significant among women than men was supported. All the correlations between Positive Friendship Qualities and mental health conditions were significant, at p < 0.01, and stronger with women while none of them were significant with men. Compared with boys, girls have been shown to spend more time talking with peers and disclosing more (Rose and Smith, 2018). Disclosure and time spent with friends were important factors of Positive Friendship Qualities in this study. This behavior may also be reflected among Duke women, and this may explain why the correlations were significant. Another reason why women had significant and strong correlations may be because they are more comfortable reporting their mental health conditions (Van Droogenbroeck et al., 2018). All the averages of negative mental health conditions were higher with women. Men may also suffer from mental illnesses in reality, but they do not report
it in psychology studies. As a result, the correlations between friendship qualities and mental health conditions may not be present in the data.

**Class Year**

My hypothesis that relationships between friendship qualities and mental health would increase among seniors was not supported. As class year increased, the correlational significance between Positive Friendship Qualities and Negative Outcomes decreased. At Duke University, freshmen exclusively live on East Campus. From the responses to the qualitative questions on the survey, it is evident that freshman dorms had a great impact on how freshmen navigated friendships on campus. Several participants mentioned that their freshman friends were their hallmates and that they found social support in their dormitory community: “The best way to meet people for me was in my common room, so most of the people I know were in my freshman dorm;” and “My fellowship and freshman dorm really helped me in finding a friend group. I was able to meet a lot of people in my dorm and get really close through dorm events or just hanging out in the common room. Even my FAC group was helpful in creating some friendships.” This social support was strengthened with freshman activities such as themed dinner nights at Marketplace – a dining hall on East Campus for freshmen.

As Duke University students enter their sophomore year, they no longer live exclusively with their class year. Students live on West Campus and Central Campus with individuals of all class years. When Duke students select their housing plans after freshman year, there is an option to block with selected individuals. This means that they can request to be assigned to the same house with a group of people, and this option is limited to up to 6 people blocking together. At Duke, a dormitory building can contain several houses, so houses are more of a social organization than a physical building. Blocking allows students to live in the same house, but it
does not guarantee that students will live adjacent to each other. Even if students block together, they may not live on the same floor, and as a result, students may not be as physically close as they were during their freshman year. There are also fewer exclusive activities for non-freshmen, so there may be less opportunities to spend time with each other following freshman year, resulting in decreased social proximity. This quote from a participant displays the importance of living together and friendship quality: “I'm still pretty close to my friends from freshman year, though there's been some drift since we don't live together anymore.” Stimulating companionship is one of the Positive Friendship Qualities, and it is dependent on spending quality time together. On average, sophomores and juniors reported less Positive Friendship Qualities than freshmen, and this could be due to the reduced physical and social proximity to each other.

For several logistical reasons, not all students who have friend groups participate in blocking. For instance, there are certain Greek groups that require their members to live together, so they may not be able to block with friends outside of their Greek group. Beyond blocking, another reason why friendship qualities and mental health conditions may become less significantly correlated is because of increased responsibilities and commitments. Sophomores, juniors, and seniors become more involved in activities outside of their friend group, such as Greek life, Selective Living Groups, pre-professional organizations, research, and other extracurricular. This may take time away from their friends, and as a result, reduce the significance between friendship qualities and mental health.

With more responsibilities, there tends to be more stress that students experience. Sophomores and juniors generally reported higher averages of depression, loneliness, and social anxiety. In addition to social stress, there may be increased stress from advanced classes and
commitments that contribute to this higher reporting of negative mental health conditions. On average, during junior year, all the negative mental health conditions peaked, and positive affect was the lowest, compared to the other class years. On the other hand, on average, seniors reported the highest positive affect and the lowest depression and loneliness. Although classes may be more advanced and difficult, seniors may be more experienced and knowledgeable on how to navigate college classes, so academic stress may be less intense. Time management skills may also improve with seniors, so the extracurricular stress may also not be as great, compared with juniors and sophomores.

Also, there are more activities exclusively for seniors, compared with sophomores and juniors. With commencement approaching, the senior class participates in activities ranging from a midnight breakfast at Marketplace to a gala at a local museum. The ability to simply participate in these activities might influence positive feelings from feeling special and rekindling with friends from freshman year. On average, seniors reported the highest Positive Friendship Qualities. Only seniors can live off campus at Duke, and they have more power in choosing their housing circumstances. This may mean living alone, with family, or with friends. Many times, seniors who live off campus do so with their friends, and this increased proximity may increase stimulating companionship.

Most (86%) of the upperclassmen (sophomores, juniors, and seniors) reported that their friendship requirements had changed since their freshman year (and their qualitative responses can be found in Appendix C). Upperclassmen no longer wanted to be friends with people with negative qualities, such as dishonesty. In line with the Socioemotional Selectivity Theory, students became selective and reported seeking deeper and fulfilling relationships. In addition, politics have influenced who people friend with: “I cannot be friends if you have really wrong
opinions on matters of women, politics.” As a result, although many upperclassmen lose their earlier friends, they may be happier with the friends they have because they fulfill important requirements:

As class year advances, these friendship requirements change and solidify. To clarify, some freshmen feel pressured to find friends, and out of desperation, may associate with people even if these people don’t necessarily have the best qualities, but they fulfil the need of social network at that moment: “Senior year I am able to relax as I only focus on nurturing the bonds that will last after Duke.... sophomore year I desperately clung onto 1-2 of the people I spent 90% of my time with.” Hobfoll (1996) explained that social support can have negative effects when it is given at an inappropriate time. It is possible that the social support that freshmen need differs from what upperclassmen need, and as a result, they will need different social networks and friends. Later, as students become comfortable at Duke and find stable sources of support, they may realize that the people who they forced themselves to be friends with are not good for them and may drop them. This participant’s response highlights this behavior: “I was very lonely my first semester. I rushed selective living groups to try to make new friends and ended up joining one in the spring--- soon after, however, I realize that the people in the group and I were not deeply compatible as friends and I detested the superficiality of the entire process and group.”

Some sophomores and juniors may still have friends with these negative qualities but eventually lose them over time and during their senior year. This behavior may be another reason why seniors report much higher Positive Friendship Qualities and lower negative mental health conditions on average compared with sophomores and juniors. Another reason why negative mental health conditions peaked during junior year is because it may be the time when students
are losing their friends and are dealing with stress from social conflicts or have lost their friends and are dealing with the loneliness from associating with less people.

**Group Size**

**Rationale for Group Size.** The group sizes were divided into their analysis groups (None, Small, Medium, and Large) based on the descriptive statistics and intuitive reasoning. Because most participants reported being in a group with 5 people, I did not want to include responses of 5 with the Small group, as this would have made the sample sizes less balanced. Also, several participants estimated that their friend group was “3-4 people” so it was difficult and unfair to split responses of 3 and 4. Because of these reasons, I began the Medium group at a group size of 5. Additionally, I began the Large group at 10 because, intuitively, it seems as if being in a group with 9 other people would be slightly different than being in a group with 10 other people. Logistically, the way people navigate things in a group of 10 (9 friends in the group) differs from how a group of 11 (10 friends in the group) would. For instance, up to 5 people can fit in standard car (which many college students have over jeeps or vans), and 2 standard cars would be needed to transport everyone in a group of 10 people. For a group of 11, 3 standard cars would be needed to legally transport everyone. This makes it harder for the friend group to commute and stay together. It becomes difficult to plan events together due to increased schedules and to sit together in some public spaces due to increased need for space. Some restaurants limit group reservations to 10 people. Also, although it is still possible with a group of 10, it seems more likely for miniature groups to form within a friend group of 11 or more people.

**Intimacy across Friend Group Size.** My hypothesis that individuals with bigger friend groups would report less intimacy with their close friend was not supported. On average, among
those with a friend group, participants with a Large friend group reported the highest intimacy while those with a Medium friend group reported the lowest intimacy.

There are three possible reasons why those with a Large group reported the highest intimacy average with their closest friend. First, this may be due to personality. One participant’s response suggested this: “I am very extroverted, outgoing, open minded and warm. I believe that you can never have too many friends, so it is very rare that I am exclusive or disinterested in making friends.” It is evident from this quote that this extroverted participant wants to make friends and does not see a limit in the number of friends. Asendorpf and Wilpers (1998) found a direct relationship between extroversion and number of friends. People who are extroverted and open may place more value on friendships (Laakasuo et al. 2017). Extroverts also reported having more friends and were likely to spend more time with their friends. There may be more extroverts with a Large friend group spending time with their friends, and spending time is important in building intimacy in a friendship. Because of this, participants in this group may have reported more intimacy. Some participants have noticed this trend and shared that they have become more extroverted to have deeper friendships: “Sometimes I struggle with being open and extroverted. I also can be awkward and bad at small talk, which is often a barrier you have to break through to get become better friends.” It is important to note that not all outgoing individuals have an easy time making friends. Transfer Participant reported: “Usually I’m good at making friends. I am outgoing and like talking to new people. Here it has not been the case.”

Second, having a close friend within a friend group promotes joint intimacy through group-bonding activities. Several participants reported that their friend group is made up of
sorority, fraternity, selective living group, and team members, and their closest friend is often a member of these groups. The aforementioned groups usually require members to spend time together, and because the closest friend is in the group, one will spend time with the group and with their closest friend. This participant displayed another benefit of having a close friend within a friend group: “... We [my closest friend and I] talk a lot about things that happen between our friend group and other things because it's nice to come home and destress.” This shared friend group allows close friends to spend time together and release stress, which are important factors of intimacy and positive friendship qualities.

The third reason is a potential limitation. The survey did not ask participants if their closest friend was part of their closest friend group. It is often assumed that one’s closest friend would also be in their closest friend group, but this quote from a participant shows that this is not always the case: “I think that it is hard to find a friend group freshman year because you have so many different groups. My groups are all spread out among my various activities. I have made a few extremely close friends in my dorm outside of my friend groups but find it hard to make time to hang out with the many different friend groups.” This is important because although one may have a friend group, they may not be intimate or active with the friend group; however, they can still be active and intimate with their closest friend who is not in the friend group, as displayed in the quote. As a result, a participant with a Large friend group may report high intimacy with their closest friend because they spend more time with their closest friend but not with their friend group. Although the most recently quoted participant reported a friend group of 7 (Medium), this behavior is still relevant to all individuals with a friend group.

Participants without a friend group reported lower intimacy averages than those with a friend group. There are two possible reasons for this. First, participants in the None group may
not have fulfilling friends in general. This may be related to personality factors, such as not having the social skills to make or keep friends and share an intimate relationship with them.

Second, it is still possible that people without a friend group may have a wide range of friends. For instance, an individual could have 30 friends, but they do not make up a friend group, so in this study, they would still be part of the None group. Reasons for this disparity include having friends from various communities and groups.

If one has several friends but not a friend group, it is difficult to build intimate relationships with the friends because often one must split their time between the friends, especially if their friends are not friends with each other. A participant defined these friends as “’groupless friends’ – aka friends that I don’t classify as/hang out with any setting other than just the two of us.” For instance, instead of going to a basketball game as a friend group and building joint intimacy, one would have to choose which friend to go with. Even if they decided to go with multiple friends, there will not be joint intimacy, as there might be jokes, stories, or secrets that everyone can not relate to. The following quote from a participant displays this behavior: “I have friends from many different groups at Duke. I have friends who I go to church with, friends with whom I eat dinner, and friends who I play soccer with. However, these groups of friends do not overlap, so I find myself divided in time between the different friend groups.... Most of my friendships at this stage in Duke are just quick conversations and have not moved past some of the introductory small talk... ” The presence of simply small talk in this participants’ relationship displays a lack of intimacy. “This [challenge with keeping friends] happens when I'm trying to juggle too many friends at a time; I have trust issues and can make impulsive decisions.” As displayed in this participant’s comment, the responsibility associated with juggling several non-overlapping friend groups promotes pressure in balancing and
spreading intimacy among several friends, and often, individuals are not successful and may ultimately find challenges with keeping their friends.

It is possible that participants without a friend group did have a close, fulfilling friend. However, there may not have been a great sample size of these individuals, as the average intimacy score was lower than those with a friend group. Participants in the None group reported the greatest variation among their (intimacy) responses, so this result supports my suggestion that their friend composition is varied and complex. In summary, individuals without a friend group may either have no fulfilling friendships or several friends without a structured and mutually intimate group. Both compositions produce limitations in increasing intimacy with a close friend.

**Mental Health across Friend Group Size.** On average, participants without a friend group reported the highest Negative Outcomes and lowest Positive Affect. Friend groups are an important type of social networks, and social networks provide support against mental illnesses (Narr et al., 2019).

**Racial Representation**

**Rationale for Racial Groups.** According to the released Duke University Class of 2022 Profile, Duke’s current freshman class is 49% White, 28% Asian/Asian-American/Pacific-Islander, 10% Black/African American, 11% Hispanic/Latino, and 2% Native American/American Indian/Native Alaskan/Native Hawaiian. I divided my participants into White, Asian (Asian, Asian-American, Pacific-Islander), and Minority (Black, Hispanic/Latino, Native American, and multiracial) groups. I divided these groups like this for 2 major reasons. First, this division helped balance the sample sizes among various groups: White (N = 54), Minority (N = 42), and Asian (N = 45).
Second, I believe that representation plays an important role in navigating friendships and social support. At Duke, the participants in my Minority group are underrepresented while Asian and White students are represented. Not all White and Asian ethnicities and countries are well represented, but in general, they are more represented than Black, Hispanic/Latino, and Native American groups. Williams (2014) found that Black students at PWIs face additional stressors that negatively impact their performance and mental health conditions. For example, these students feel pressured to represent Black people well, as they are a minority in the academic program. Black students at HBCUs do not face these stressors, as there are not an underrepresented racial minority. Williams (2014) also concluded that anxiety is associated with a lack of social integration into the college. Social integration was measured by interactions with peers and faculty at the college. Black students at PWIs face barriers, such as stereotype threat, that limit their social integration into their intuitions. In addition, racial microaggressions affected Black students’ ability to integrate in their PWI (Solorzano et al., 2000). This was associated with increased feelings of doubt and isolation. Many of the students depended on other Black students and Black organizations to survive their PWI experience.

For these reasons, I believe that racial representation impacts mental health and one’s experience with social support and friendships. As a result, I grouped the groups based on representation at Duke. It is important to note that there is more to representation than race. Other factors like socioeconomic and sexual orientation may impact one’s ability to form friendships, but for this study, I am analyzing representation along racial lines.

**Mental Health across Racial Groups.**

My hypothesis that underrepresented minority Duke University students would have significant correlations between friendship qualities and mental health conditions was supported.
Minority students’ correlations had the lowest p-value and the greatest correlational strength between friendship qualities and all the mental health conditions. As previously highlighted in the introduction, Black, Hispanic/Latino, and Native Americans value social networks, and as a result, these networks often predict and associate with mental health conditions.

Having such strong correlations between friendship qualities and mental health conditions among Minority groups has benefits and risks. Some participants suggested that associating with Minority organizations and students helped their transition into college: “There was a large group chat for black students coming to Duke. I joined the group and once I got to campus we all decided to meet up and that is how we became friends. I found the people I connected most with an those are the people I consider my closest friends,” and “I am friends with a pretty good amount of people; most of them I have met through classes via. group projects and labs, or from events that stem from being apart of the black Duke community.”

On the other hand, because Minority students place value on their social bonds, when these bonds don’t develop or break, it could have negative outcomes. For instance, some Minority students have difficulty relating to Duke’s student population, and this impacts their ability to make friends and their wellbeing: “Depending on the environment, it can be hard to make friends, especially if I’m not very comfortable (cough cough an all-white, cishet male environment). A lot my humor is based in my experiences as a minority member of society, so if there aren't people who can relate, it just falls flat. On top of that, a lot of my passions are based in social justice and health disparities, which isn't always people's cup of tea. Plus, I can come off as intimidating and uninterested sometimes,” and “My social anxiety has gotten a lot worse since I've gotten to Duke. I really don't know if it's possible for me to find friends here.
Especially with being a black girl from a low income 1G family. I can’t relate to a lot of students.”

It is important to note that, compared with positive affect, depression, and loneliness, the correlation between Positive Friendship Qualities and social anxiety had the greatest disparity between represented racial groups and underrepresented racial groups. The correlation was extremely significant among Minorities ($r = -.502$) and not with White ($r = -.266$) and Asian ($r = -.294$) students. Studies have shown that SAD has a strong association with experiences of discrimination among Black people (Levine et al., 2014). Compared with Asian American college students, Latino college students are more likely to face discrimination, which was associated with higher distress, anxiety, and depression (Hwang and Goto, 2008). Duke University has had many negative racially-driven incidents that may elicit feelings of discrimination and racism among students. For instance, there was a noose hung on a tree near the Bryan Center in 2015. Later that year, a Black Lives Matter poster was defaced with a racial slur, and last year, a Duke student posted a social media video, saying racial slurs.

Some Minority students reported growing away from their Minority friends or wanting more from friends than shared racial identity: “I feel like my freshman year I realized that you couldn’t trust everyone around you and you need to be very selective about who you tell your business to, especially in the black community - so I kind of fell back and became closer to the people I knew I could depend on,” and “…[now] I require more of my friends than simply being Black women…”

It is important to highlight that all these quotes were from Black participants. In the open-ended responses, only Black students mentioned their race or status as a minority in their responses. Participants from other racial groups did not bring up race or identity. This supports
the suggestion that minorities’ racial identity and representation is an important factor in the relationship between friendship qualities and mental health conditions among college students, especially for Black Duke students.

As displayed in the previous quotes, Minority groups are important in finding social support. Studies have shown that students of color who attend PWIs are more likely to remain in college (not transfer) when they participate in extracurricular groups associated with their culture or ethnicity (Sutton & Kimbrough, 2001). This is because extracurricular groups support these students transition into college by filling in cultural gaps (Padilla et al., 1997). Guiffrida (2003) explained that African American college students who participated in these groups were better socially integrated into their PWI and reported higher GPAs. A reason why Minority students at Duke have strong correlations between friendship qualities and mental health may be related to the availability of these groups. According to the Duke University’s “dukegroups” site, there are the 56 “cultural and identity” student organizations at Duke (out of 400+ groups), and of these groups, 20 of them were for Minority students. Of these 20 groups, 13 of them were for students who identified as part of the African diaspora.

There are 18 groups for Asian students. Although there are more groups available for Asian students, the groups were more varied and specific compared with those for Black students. For example, most of the Black groups were labeled as “Black,” such as Black Student Union, and a few groups were labeled based on region or continent, such as DukeAFRICA and Students of the Caribbean Association. There was only one group for a specific Black country, Haitian Student Alliance, and this organization is currently closed. However, Asian groups were more specific – directed to single countries or regions. For example, there is the Asian American Alliance, Duke Chinese Theatre, and Duke Taiwanese Student Association. This trend is
understandable because there are less Minority students than Asian students, and it may be
difficult to divide Minority groups into even smaller organizations. However, the Black diaspora
is very culturally diverse, and some Black Duke students may not find comfort in the Black
student groups due to lack of representation (as suggested by some of the previous quotes). This
may be a reason why there were significant differences in Positive Friendship Qualities between
Asian and Minority students. There were no significant differences between Asian and White
students though, and these two groups are generally represented at Duke. Racial representation in
college may have an important impact on how students navigate and experience social support.

It is important to note that there are other predominantly minority or racially-oriented
groups (like Greek groups) that were not displayed on the list of “cultural and identity” student
organizations. For example, Minority Association of Pre-Medical Students was not included
even though most of the members are minorities (predominantly Black), and this may because its
primary function is academic and not cultural.

**Implications**

The results from this study indicate that friendship qualities significantly predict mental
health conditions among college students, and these results are important because their
implications affect students’ mental health, physical health, and social outcomes. As the
literature suggests, there is an inverse relationship between social support and mental illnesses.
There are both short-term and long-term consequences of poor mental health, and these include
premature mortality due to diseases and suicide.

Similarly, studies have shown that one’s social network size affects the development of
psychological stress and physical health. Students usually enter college relatively healthy, but
over time, their physical and mental health deteriorates (Hussain et al., 2013). Pressman et al.
found that healthy college freshmen, who had a small social network and were lonely, had a weaker antibody response to the influenza immunization. It is important for college students to maintain their physical health to perform well in college and advance their career. People with poorer physical health are more likely to be unemployed, school dropouts, and sufferers of drug addictions (Van Droogenbroeck et al., 2018). Because the lack of social support can indirectly impact one’s physical and mental health, it is important to prioritize associating with high-quality individuals.

Moreover, this research displayed a risk of not having quality friendships at Duke: transferring out. Students who transfer between schools are more likely to drop out entirely out of college, and this is especially prevalent right after freshman year (Herzog, 2005). Dropouts tend to have poorer health due to lack of education and less satisfaction with life, and researchers have suggested that the dropout problem should be considered a public health problem (Freudenberg and Ruglis, 2007). Factors that impact one’s likelihood to dropout include mental illnesses and a lack of social belonging (Pittman and Richmond, 2008). In this study, Transfer Student was a Minority, freshman, and a woman, and this study identified that participants from those groups reported stronger and significant relationships between friendship qualities and mental health. Institutions, specifically Duke, can use this information to target students whose mental health may be more dependent on social support and ensure that they are receiving the support that they need.

Freshmen had significant correlations between friendship qualities and mental health conditions, and Duke has programs to aid freshmen’s transition to college, such as preorientation and orientation week. However, for some students, these programs were not as helpful: “O-week was very hectic and I met a lot of new people, but didn’t feel like I had time to build relationships
“with them.” This was a common complaint, so organizers of orientation programs can use this and make adjustments to promote building relationships between students.

In addition, Duke can aid in the transition between freshman and sophomore years, as several participants reported that they fell out of touch with their friends once they left East Campus. Sophomores and juniors reported higher averages of negative mental health conditions and lower averages of Positive Friendship Qualities, compared with freshmen. Although there are various factors that contribute to this behavior, social support is still important, and a drastic change, such as leaving East Campus and freshmen-oriented programs and spaces, could be aided with institutional assistance.

Also, transfer students have difficulties transitioning to Duke’s campus, and this is supported by this participant’s response: “I transferred here which added a new dynamic to forming friendships as most people were already entrenched in pre-existing freshmen year friend groups.” This participant reported the second highest Negative Outcomes score (followed by Transfer Student’s). It is important for colleges to aid transfer students’ transition into a new environment as well, and this could be done through the implementation of social activities.

Limitations

There was not an equal sample of genders, racial groups, and class years. This study did not control for sample size, so some correlation results may be driven by the excess or lack of grouped participants, especially with the gender analysis. However, I included the correlation with Negative Friendship Qualities, and this was significant with both men and women, so it is possible that unequal sample sizes did not greatly limit the results. Additionally, this study utilized self-reported data, and participants may have exaggerated responses or hid information that may be embarrassing. This is especially important because the participants and I are all
Duke undergraduates, and participants who knew me may have wanted to conceal negative information, either about their friendships or mental health, even though I reassured in the study consent form that all identifying information would be removed from the data. To address this limitation, in the future, I can collect observational data in addition to self-report. For example, I can observe behaviors between friends and identify the present friendship qualities.

Similarly, some of the Minority participants may have known me, as I advertised the study through some student organizations that I am involved in. Even though I did not intentionally select specific participants, this could still be a type of sampling bias. This limitation is more prevalent because Duke’s Minority population is small, and many people know each other. For me to collect representative responses from Minority students at Duke, I would have inevitably gathered information from students who I knew.

Furthermore, I collected all my responses within a month – February. Friendships and relationships are fleeting. One moment, people could be best friends, and the next week, they could be fighting. Even if a participant’s closest friend has been low-quality in the past, if they were high-quality around the time the participant took the survey, then the responses may be positively skewed. This would not be reflective of that friendship’s qualities. Additionally, Valentine’s Day played a role in how participants reported their friendship qualities. For participants whose closest friend was their significant other and took the survey around Valentine’s Day, they mentioned more positive qualities and associated these qualities with recent activities from Valentine’s Day. In February, some study away programs are just beginning. For participants who participated in a study away program, they may have faced additional stressors of adjusting to a new environment and being physically away from their
closest friend at Duke, and this may impact their experience with friendship qualities. To address this limitation, in the future, I will spread data collection over a longer period.

Several of the mental health questions asked participants to answer based on their feelings over the past week. There are several things that impact one’s mental health, especially as a student. If something drastically bad occurred, such as failing a midterm, right before taking the survey, a participant may report more symptoms of negative mental health conditions, even if it is not extremely dependent on friendship qualities.

The Negative Friendship Qualities questions were the most skipped. Only 102 participants answered all of them. The others (39) either skipped 1 or 2 of these questions. Most of them only skipped 1. This is important because these participants answered all the Positive Friendship Qualities questions. The Negative Friendship Qualities came before the Positive Friendship Qualities questions in the survey, and there were only 9 of them. There were 48 Positive Friendship Qualities questions. Because of this, it is unlikely that participants skipped the Negative Friendship Qualities questions because of their quantity. They may have skipped because of the format. The questions were on a sliding scale in which participants would have to drag their response from 0 to 100. If a participant was unfamiliar with this format or if it was less compatible with their mobile device, then they may have skipped. Another reason could be because of the range of potential responses. The Negative Friendship Qualities responses had the largest range and standard deviations. Participants could choose from 0 to 100, and if people are indecisive, they may struggle with responding. The greatest reason why I think participants skipped these questions is because of how hypothetical and negative they were. Of the questions that were skipped, all of them were the directly negative ones and not the questions that were reverse scored. Participants may not be able to imagine how their close friend would behave in a
certain negative light. There are some negative behaviors in a relationship that one cannot predict and will only know once they experience it. Also, the participants may not have wanted to think negatively of their close friend. This may explain why Negative Friendship Qualities was not a significant predictor of mental health conditions, but Positive Friendship Qualities was.

It is possible that for some participants’ responses, their group size may be off by one person. The question -- “how many people are in your closest group” -- may not have been completely clear, as some participants reported a number and in parenthesis clarified whether that number included them or not. It is understandable to see why this happened, as the question did not explicitly state whether to include oneself. Fortunately, participants had the space to clarify that and were not restricted to just selecting a number. The intention was for participants to report their friend group, excluding themselves, and I analyzed the data with this intention. To address this limitation, in the future, I will make directions extremely clear.

The way I racially grouped students may have limitations. A couple of participants reported being mixed with Asian and White, or White and Black. I put these multiracial individuals in the Minority group, but they may or may not have shared cultural values with the other Minority students. For instance, if a multiracial (White and Black) student grew up only with their White parent and family, they may see things a bit different from Black students or multiracial students who grew up with both identities. Multiracial and multicultural individuals have varied experiences. Every student has their unique and valid experiences with social relations, and this may have become overshadowed or lost with the grouping.

**Future Directions**

This research can be expanded and improved by navigating the relationship between friendship qualities and mental health conditions among best friends, acquaintances and ex-
friends. In the future, it will be important to have equal sample sizes to accurately investigate group differences and trends in the relationship between friendship qualities and mental health conditions.

Some people don’t have any close friends at Duke, but for the sake of this study, they may have felt pressured to pick someone who they are closer to compared with others in Duke’s general population. Transfer Participant displayed this struggle: “My best friend here is my roommate. We’re not actually that close or that similar, but we have enough in common and are both nice.” Future research should study people who don’t have a close friend on campus. This could mean not having close friends or friends in general, or it could be people whose close friend is off campus.

From this study, people who did not have a close friend group reported the highest averages of negative mental health conditions. For people who do have a friend group, is there a maximum or peak number of friend groups that one can have? Is there a maximum or peak number of close friends one can have before the stress associated with keeping up with multiple people impacts one’s wellbeing? Is it better and healthier to be in the same friend group with one’s closest friend?

There was much variation among freshmen. There were some people like Transfer Participant who did not have any fulfilling friends, and there are others who reported having a friend group of 30 people. Seniors reported the highest average of positive affect and lowest averages of negative mental health conditions. Future research should analyze freshmen and seniors separately to navigate the variability among freshmen and the trend of positive mental health conditions among seniors. Future research should also calculate, by class year, the
percentage of upperclassmen who reported that their friendship requirements had changed. How do friend group sizes change by class year?

Asian participants reported the highest averages of loneliness, depression, and social anxiety, and lowest positive affect average. In the future, it would be worth analyzing why this is the case. Are there cultural or identity factors that influence this high average of negative mental health conditions among Asian Duke undergraduates? It will be important to identify the number of international students who are in this sample, as they may face unique stressors that impact their ability to make friends at Duke and their mental health.

Friendship qualities impact mental health but does mental health impact friendships? When answering why they have challenges with making friends, a participant reported: “It all really depends on my mental health - I have mental health issues, so when my mental health is not great, I am generally not great at making friends.” Do students who have mental illnesses generally have less friends? Are these individuals more likely to lose their friends?

Future studies should analyze differences in responses between female and female, female and male, and male and male friendships. This study adapted a personality test to analyze participants’ personality; however, this data was not utilized in the results. To expand on this research, participants should be grouped based on their personality score to identify differences in correlations and significance of friendship qualities and mental health conditions. Are Duke students generally extroverted? Which types of students are likely to be extroverted? Are friends attracted to individuals with similar or different personalities? Lastly, future research should examine similarities between high-quality close friends. Do these friends share the same gender, class year, race, ethnicity, SLG, Greek group, athletic team, etc.?
References


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Appendix A (1)

1. Stimulating Companionship
   a. ___ is fun to do things with
   b. ___ tells me interesting things
   c. ___ has good ideas about entertaining things to do
   d. ___ makes me laugh
   e. ___ is exciting to talk to
   f. ___ is enjoyable to be with
   g. ___ is exciting to be with
   h. ___ is fun to sit and talk with

2. Help
   a. ___ helps me when I need it
   b. ___ helps me when I need someone else’s opinion
   c. ___ gives me useful information when I need it
   d. ___ helps me do things
   e. ___ lends me things that I need
   f. ___ is willing to do favors for me
   g. ___ helps me when I’m trying hard to finish something
   h. ___ shows me how to do things better

3. Intimacy
   a. ___ is someone I can tell private things to
   b. ___ knows when I’m upset
   c. ___ is someone I can tell secrets to
Appendix A (2)

d. ___ knows when something bothers me

e. ___ would listen if I talked about my problems

f. ___ would understand me if I told her/him my problems

g. ___ is easy to talk to about private things

h. ___ understands my feelings

4. Reliable Alliance

a. ___ would still want to be my friend even if I were angry with him/her

b. ___ would stay my friend through bad times

c. ___ would want to stay my friend if we didn't see each other for a few months

d. ___ would still want to be my friend even if we had a fight

e. ___ would stay my friend even if other people criticized me

f. ___ would stay my friend even if other people did not like me

g. ___ would still want to stay my friend even if we argued

h. ___ would still want to be my friend even if I didn't have time to see her/him a

5. Self-Validation

a. ___ makes me feel important

b. ___ makes me feel good about myself even when I mess up

c. ___ makes me feel sure of myself

d. ___ makes me feel smart

e. ___ makes me feel special

f. ___ compliments me when I do something well

g. ___ points out things that I am good at
Appendix A (3)

h. ___makes me feel that I can do things well

6. Emotional Security

a. ___would make me feel comfortable in a new situation

b. ___would be good to have around if I were frightened

c. ___would make me feel better if I were worried

d. ___would make me feel calmer if I were nervous

e. ___would make me feel better if I were in trouble

f. ___makes me feel better when I have problems

g. ___would make me feel better if I were anxious

h. ___makes me feel better when I'm upset
Appendix B (1)

1. How likely is this friend to intervene when other people are being mean to you? 
   (Please rate how likely this friend is to intervene with 0 as extremely unlikely and 100 as extremely likely) *

2. How demanding is this friend? (Please rate how demanding this friend is with 0 as not demanding at all and 100 as extremely demanding)

3. How likely is this friend to lie or hide information from you (whether to spare your feelings or to be shady)? (Please rate how likely this friend is to lie or hide information with 0 as extremely unlikely and 100 as extremely likely)

4. How genuinely does this friend celebrate your victories? (Please rate how genuinely this friend celebrate your victories with 0 as extremely disingenuous and 100 as extremely genuine *)

5. How likely would this friend stick up for you if others talked behind your back? 
   (Please rate how likely this friend is to stick up for you with 0 as extremely unlikely and 100 as extremely likely) *

6. How likely would this friend join in with others who talk behind your back? (Please rate how likely this friend is to join in on talking behind your back with 0 as extremely unlikely and 100 as extremely likely)

7. How competitive is this friend with you? (Please rate how competitive this friend is with 0 as extremely noncompetitive and 100 as extremely competitive)

8. How quickly do you two get over arguments? (Please rate how quickly you and your friend resolve arguments with 0 as extremely slow and 100 as extremely quickly) *
Appendix B (2)

9. How easily do you two make up after having a fight? (Please rate how easy it is for you and your friend to make up after fighting with 0 as extremely difficult and 100 as extremely easy) *

* Reverse scored
Appendix C (1)

1. I became very close with my fraternity brothers and do not hang nearly as much with my first-semester freshmen year friends anymore.

2. I look for less very close friendships now because they're too difficult to get

3. I need people who can facilitate a deeper conversation outside of shooter/devines

4. I used to tolerate people who I knew would talk negatively about me, but now I try to remove those types of people from my life.

5. I have gained more deep friendships.

6. My requirements are just that I relate to that person in anyway. My requirements have decreased because I find that if anyone is showing me respect, I will consider him/her a friend.

7. Prefer people who are a lot more laid back and not social climbers, which Duke has a lot of and I had a lot of in high school so I am pretty tired of it.

8. In freshman year, I just wanted people to talk to, but now I want people I actually connect with.

9. I didn't use to believe in the positive attitude value.

10. My boyfriend was involved in a controversial incident last school year and this caused many of my friends to lose contact.

11. I realized that I wanted friends who didn't focus that much on social status and could let loose more. That's something I never really thought of my freshman year.

12. I didn't really branch out first year from my initial pre-o friends. I think I’ve been kinda forced to but glad to branch out more
Appendix C (2)

13. Before, since I didn't know anyone I hung out with people living near me or in my classes but I tend not to do that as much anymore and focus on the organizations I am in.

14. I have met new people that are more similar to me and that I get along with better rather than people that were only my friends for convenience.

15. I think I like to have more intentionality in who I am friends with. People I actually like spending time with who have similar interests

16. I no longer want someone as a friend who doesn't encourage me to be better.

   Freshman year my friends encouraged complacency and I realized that I want to continue to keep growing and bettering myself because there is always something to improve

17. I think friendships have become more deep as we spend more time getting to know each other. I think there are also people who you see more or less depending on the semester and how different peoples' time commitments match up.

18. I definitely have better quality friendships as we've gotten to know each other better throughout the years. I know who the friends I can depend on are, whereas in freshman year I was more just trying to find friends who are long term rather than temporary.

19. I ask for more support from my friends

20. I don't actively try to make or maintain friends anymore. If someone and I vibe, then we will hang out more. If we're drifting apart, then so be it.
Appendix C (3)

21. I feel like they've changed because now I feel like I require the give and take in friendships to be equal. Before, I feel like I was the type of person to give and give and not require much to be given back. I realized how draining and detrimental that was.

22. I think for me, physically seeing people plays a much smaller part in my friendships. I still consider myself to be good friends with people who I may not see everyday or who I don't necessarily talk to all the time.

23. I value different things, especially valuing that my friends have the same views on social priorities (hanging out over board games instead of going to a party, for example).

24. Jumping colleges means new people and new dynamics to realize.

25. I don’t have as many friends as I did freshman year. I have learned how to navigate who is a better friend than who.

26. I feel like my freshman year I realized that you couldn't trust everyone around you and you need to be very selective about who you tell your business to, especially in the black community - so I kind of fell back and became closer to the people I knew I could depend on.

27. Freshmen year I just really wanted to make friends and didn’t really care with who, now I am more picking and am looking to form deeper bonds.

28. I need people I really enjoy being around and vibe well with.

29. I value having friends with similar ambitions a lot more.
Appendix C (4)

30. I value friendships where I can grow within the friendship. I don't make friends as quickly as before but now I'm more focused on building life-long friends.

31. Senior year I am able to relax as I only focus on nurturing the bonds that will last after Duke; my junior year at Duke felt the most social perhaps --- I knew the greatest number of people from years both above and below me; sophomore year I desperately clung onto 1-2 of the people I spent 90% of my time with.

32. I now value honesty and similar interests much more. In addition, if I feel that a friendship is not benefitting me positively or I am not growing/becoming a better, more fulfilled person because of it, I no longer waste time with that friendship and stop investing in it.

33. I require more alone time but I know I need friends who are intentional

34. For starters, I require more of my friends than simply being Black women. I also realized I don't want shallow relationships so I treat these relationships and hold them to a rigor that I would expect similar to life outside college

35. their goals have to align with mine (we have to be hanging out in a situation that benefits us both)

36. I used to expect my friends here to be more like my friends back home. Now, I'm much more appreciative of the unique, positive qualities that my friends have here.

37. Freshmen year I looked mainly for a good group of people to eat, study, and go out with. Now I find myself wanting more trust and reliability out of these friendships than before.
Appendix C (5)

38. Friend groups have reshaped and many friends have been reworked into different groups

39. I cannot be friends if you have really wrong opinions on matters of women, politics

40. My freshman year requirements were much more superficial. Now I look for people who I could spend a lot of 1-on-1 time with and not get bored

41. "More effort"