LOYOLA UNIVERSITY CHICAGO

EXAMINING OUTCOMES AND MECHANISMS
OF THE HONEST, OPEN, PROUD INTERVENTION
IN COLLEGE STUDENTS WITH MENTAL ILLNESS

A THESIS SUBMITTED TO
THE FACULTY OF THE GRADUATE SCHOOL
IN CANDIDACY FOR THE DEGREE OF
MASTER OF ARTS

PROGRAM IN CLINICAL PSYCHOLOGY

BY

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CHICAGO, IL

DECEMBER 2018
ACKNOWLEDGMENTS

First, I would like to thank my research mentor and director for this thesis, Dr. Colleen Conley, for her guidance throughout this process. I would also like to thank Dr. Pat Rupert for her thoughtful feedback as my second reader. A big thank you to the entire IMPACT Lab, particularly Jenna Shapiro and Brynn Huguenel, for their work on the HOP study, as well as their moral support throughout the writing process. Thank you to my cohort, the “Fab Five,” for getting me through graduate school thus far with their jokes, their commiseration, and their love. Finally, thank you to my incredible partner Grant and to my parents for their unconditional love and support, without which none of this would be possible.
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CHAPTER ONE
INTRODUCTION

Emerging adulthood is a developmental stage involving many changes and transitions (Arnett, 2004; 2006). The instability during this time can cause significant distress, making this a period of increased vulnerability for the development of mental illness (Kessler et al., 2007; Schulenberg & Zarrett, 2006). A majority of emerging adults in the United States attend some form of postsecondary education (National Center for Education Statistics, 2016) and overall rates of mental illness do not differ between those who attend college and those who do not (Blanco et al., 2008). Rates of mental illness on college campuses have risen exponentially over the past decade (Center for Collegiate Mental Health, 2017), with depression and anxiety being the most common concerns (Center for Collegiate Mental Health, 2017; Reetz, Bershad, LeViness, & Whitlock, 2016). Psychosocial health predicts better academic performance and retention (Pritchard & Wilson, 2003), making university administrators particularly interested in how to improve the mental health of their students (Gerdes & Mallinckrodt, 1994).

This rise in the incidence of mental illness on college campuses has caused an increased demand for mental health services (Kadison & Digeronimo, 2004; Salzer, 2012). Unfortunately, college students face many barriers to treatment, including internal barriers such as personal stigma (Eisenberg, et al. 2009) and external barriers such as waitlists at university counseling centers (Reetz, et al., 2016). These barriers indicate the need for alternative approaches to address the psychological needs of college students. Honest, Open, Proud for college students
(HOP-C) may be one such alternative. HOP-C is a peer-led group-based intervention designed to reduce self-stigma in college students living with mental illness. Self-stigma is associated with lower quality of life, diminished self-esteem and self-efficacy, and poor academic outcomes (Corrigan & Shapiro, 2010; Corrigan, Watson, & Barr, 2006; Quinn & Earnshaw, 2013; Quinn, Kahng, & Crocker, 2004). The intervention is led by peers with mental illness, and addresses self-stigma via discussions about disclosure and opportunities to share one’s story with a small group of peers. An earlier version of the same intervention led to decreased self-stigma in samples of adults (Corrigan et al., 2015; Rüsch et al., 2014) and adolescents (Mulfinger et al., 2017) with mental illness.

The peer-led group component of HOP-C could improve students’ relationships to their college peers as well as to the college itself. Emerging adulthood is a time when social support is particularly salient (Lane, 2015) and when peers tend to take over from parents as the primary attachment figures (Swenson, Nordstrom, & Hiester, 2008). High social support from peers is associated with greater academic success and retention (Gloria & Ho, 2003), higher satisfaction with one’s college or university (Astin, 1993), and fewer depression symptoms (Armsden & Greenberg, 1987; Cohen & Hoberman, 1983; Hefner & Eisenberg, 2009; Hirsch & Barton, 2011). Attachment to one’s college or university (i.e., institutional attachment) similarly predicts higher levels of psychological well-being (Love et al., 2009). These factors could partially explain whether participating in a peer-led group-based intervention improves mental health outcomes in college students.

Using a serial mediation model, the present study investigates outcomes and mechanisms of the HOP-C intervention using data from a multi-site study across three college campuses. The
current study examines (1) whether participating in HOP-C (compared to a control group) reduces symptoms of depression and anxiety; (2) whether participating in HOP-C (compared to a control group) increases institutional attachment; (3) whether satisfaction with college peers mediates the relation between HOP-C participation and institutional attachment; (4) whether institutional attachment mediates the relation between HOP-C participation and symptoms of depression and anxiety; and (5) whether a serial model incorporating both mediators can elucidate the mechanisms behind these relationships.
CHAPTER TWO

REVIEW OF THE RELEVANT LITERATURE

Developmental Framework: Emerging Adulthood

Emerging adulthood, usually defined as the developmental stage from age 18-25, is a period characterized by identity exploration, instability, and uncertainty (Arnett, 2000; Arnett, 2004). Individuals in this age group tend to feel as though they are in between stages, identifying neither as adolescents nor as adults (Arnett, 2004). Emerging adults are a very heterogeneous group, and are in fact partially defined by their heterogeneity (Arnett, 2006). Many emerging adults experience environmental changes, such as moving out of the parents’ home, enrolling in college, beginning long-term romantic relationships, and entering the workforce for the first time (Abouer, 2004; Fadukoff, Kokko, & Pulkkinen, 2007). It is also a time of increased independence and self-focus, during which individuals clarify their values, develop skills, and make major decisions concerning education, work, and love (Arnett 2004; 2006). These transitions can have an enormous impact on mental health (Schulenberg & Zarrett, 2006).

In part due to the number of environmental stressors present, emerging adulthood is a time of heightened vulnerability for, and increased incidence of, psychopathology (Kessler et al., 2007; Schulenberg & Zarrett, 2006). These years are considered a “critical juncture in the development of mental illness” (Lane, 2015, p. 30). Almost half of emerging adults in the United States meet diagnostic criteria for a mental disorder (Blanco et al., 2008) and it is a particularly sensitive period for depressive disorders (Schulenberg & Zarrett, 2006). The sudden decrease in
institutional structure that occurs as one exits adolescence and enters emerging adulthood leads to a sense of floundering that can be debilitating (Mortimer, Zimmer-Gembeck, Holesm, & Shanahan, 2002). Even at a four-year college, most emerging adults experience far less imposed structure than they did during adolescence (Arnett, 2006; Schulenberg & Zarrett, 2006). With this increased freedom comes less built-in social and institutional support (Arnett, 2006; Masten et al., 2004) at a time in development when social support is particularly salient as a protective factor (Collins & van Dulmen, 2006; Lane, 2015). Interestingly, although the incidence of psychopathology increases during emerging adulthood, overall mental health and well-being also increase (Schulenberg & Zarrett, 2006).

While countless studies have been conducted with this age group, these studies usually lack a coherent developmental framework (Arnett 2006; Schulenberg, Sameroff & Cicchetti, 2004). Historically, when taking a developmental perspective to the emergence of psychopathology, there has been a focus on early childhood experiences; only recently has this perspective broadened to consider experiences throughout the life course, including emerging adulthood (Burt & Masten, 2010; Schulenberg et al., 2004). When examining trajectories across the lifespan, person-context interactions are critical in determining the effect of early experiences on mental health outcomes (Schulenberg et al., 2004). For example, major life transitions such as the transition to college can serve as turning points in one’s mental health trajectory by activating underlying vulnerabilities (Aseltine & Gore, 1993).

Several conceptual models exist to explain the relationship between developmental transitions and increased mental health risk (Schulenberg & Maggs, 2002). The overload model posits that major transitions “overwhelm one’s coping capacity, resulting in decrements in health and well-being” (Schulenberg & Zarrett, 2006, p. 153). This model provides a framework for
understanding the increased risk of mental illness associated with emerging adulthood. Due to its transitional nature, some degree of instability and uncertainty during emerging adulthood is normative. Emerging adults even experience normative neurobiological changes, as prefrontal cortex pruning continues well into the 20s (Schulenberg et al., 2004). While the various developmental tasks of emerging adulthood can be stressful, it is only when these challenges overwhelm one’s existing resources that psychopathology may develop (Schulenberg & Zarrett, 2006).

**College Students and the “Campus Mental Health Crisis”**

There are more emerging adults in postsecondary education today than at any other time in U.S. history (Arnett, 2016); about 70% of high school graduates enrolled in some form of postsecondary education in 2016 (U.S. Department of Education, 2016). Overall rates of mental illness are not different between emerging adults who attend college and those who do not, though college-attending emerging adults are less likely to have a severe mental illness, such as bipolar disorder, than their peers who do not attend college (Blanco, et al., 2008). Thus, despite similar rates of mental illness overall, college students do tend to be psychologically healthier than the general population, suggesting that “indicators of psychopathology may have to be interpreted somewhat differently for college students” (Arnett, 2016, p. 221).

While college students may, in general, experience less severe forms of psychopathology than their non-college-attending peers, emerging adults with mental illness have been enrolling in college in increasing numbers over the past couple decades (Salzer, 2012; Souma, Rickerson, & Burgstahler, 2002). Whether due to greater access to treatment, lowered social stigma around less severe mental illness, or a combination of factors, this increase has intensified the demand for psychological services on college campuses (Kadison & Digeronimo, 2004). The Center for
Collegiate Mental Health reports that, over the past five years, utilization of counseling centers increased by 30% while average enrollment grew by 5% (CCMH, 2017). This recent phenomenon has brought attention to existing deficits in university mental health services across the country (Salzer, 2012), straining campus resources and leading some to argue that we are currently experiencing a “campus mental health crisis” (Kadison & Digeronimo, 2004, p. i). According to the Association for University and College Counseling Center Directors annual survey, anxiety (51%) and depression (41%) are by far the most commonly reported concerns among college students seeking services (Reetz, Bershad, LeViness, & Whitlock, 2016). The Center for Collegiate Mental Health also list anxiety and depression as the two most common concerns and reports similar, though slightly higher, rates (61% and 49%, respectively; CCMH, 2017).

Psychological factors such as social and emotional health predict adjustment to college, academic performance, and retention for college students (Pritchard & Wilson, 2003). Almost three-quarters (72%) of college students who received counseling services in 2016 reported that it promoted their academic performance (Reetz et al., 2016), indicating a strong link between mental health and academic success in this population. Conversely, mental illness substantially increases risk for dropping out of college (Kessler, Foster, Saunders, & Stang, 1995). Students with mental illness withdraw from college prior to completing their degree at almost twice the rate of the general student population (Salzer, 2012). Because retention rates (i.e., the percentage of freshmen who return to the same school for sophomore year, or the percentage of students who ultimately graduate) are often used as a metric for university success, university administrators are particularly invested in how to improve retention among their students (Gerdes & Mallinckrodt, 1994).
It is clear that universities must provide adequate mental health care options to their students in order to promote strong academic and psychosocial outcomes. However, various common barriers to treatment exist for college students, including personal stigma (Eisenberg, et al. 2009), time constraints (Czyz, Horwitz, Eisenberg, Kramer, & King, 2013), a lack of awareness about services available, and skepticism about the effectiveness of therapy and/or medication (Eisenberg, Golberstein, & Gollust, 2007). In one survey, 66% of college students at elevated suicide risk reported that they did not seek help due to the belief that professional treatment was not needed (Czyz et al., 2013). Additionally, due to high demand for services, students often face under-resourced counseling centers with long waitlists (Kadison & Digeronimo, 2004). The Association for University and College Counseling Center Directors reported in their 2016 annual survey that 36% of the 529 participating counseling centers endorsed having a waitlist (Reetz, et al., 2016). These barriers indicate a need for alternative approaches to address the psychological needs of college students.

**Self-Stigma and Mental Illness**

Ervin Goffman (1963) originally defined stigma as an attribute that reduces a person “from a whole and usual person to a tainted, discounted one” (p. 3). Mental illness is far more stigmatized than other types of illness or disability, ranking with drug abuse and criminal status in terms of public stigma (Holmes & River, 1998). *Public* stigma consists of stereotypes (beliefs), prejudice (attitudes), and discrimination (attitude-driven behavior; Smith, 2014). *Personal* stigma, or self-stigma, can be understood in similar terms. Individuals who agree with negative stereotypes about themselves will experience a negative response or attitude toward themselves (i.e., self-prejudice), which often includes diminished self-esteem and self-efficacy. Self-prejudice may then lead to behavioral responses (i.e., self-discrimination), such as social
isolation. It is important to note that awareness of stereotypes is not the same thing as agreement
with them; many individuals living with a stigmatized identity endorse awareness of negative
stereotypes about their group but not agreement with those stereotypes (Corrigan & Watson,
2002).

Self-stigma is associated with substantial psychological distress and lower quality of life,
and is a major predictor of the course of mental illness (Corrigan & Shapiro, 2010; Quinn &
Earnshaw, 2013). Research has consistently found self-stigma to predict lower self-esteem and
self-efficacy after accounting for depression symptoms (see Corrigan, Watson, & Barr, 2006).
Additionally, greater self-stigma is associated with worse treatment participation and adherence
(Fung, Tsang, & Chan, 2010), as well as early treatment termination (Sirey, et al., 2001). In
college students, self-stigma related to mental illness may have an effect on academic outcomes.
For example, college students with mental illness who were asked to reveal their mental health
history immediately before taking a reasoning test did worse on the test compared to those who
were not asked about their mental health history (Quinn, Kahng, & Crocker, 2004). Self-stigma
is also a major barrier to help-seeking in college students (Eisenberg, Downs, Golberstein, &
Vogel and colleagues (2007) demonstrated that the relationship between perceived public stigma
and help-seeking attitudes was fully mediated by self-stigma. In the same study, the relationship
between perceived public stigma and the intention to seek counseling was also fully mediated by
self-stigma. Similarly, greater self-stigma is significantly associated with less help-seeking
behavior in college students, whereas greater perceived stigma is not (Eisenberg, et al., 2009).
This suggests that agreement with stereotypes is far more harmful than awareness of them. It
also indicates that reducing self-stigma in college students could increase help-seeking in this
population.

Goffman (1963) distinguished between two types of stigmas: discrediting (visible stigmas such as race) and discreditable (invisible or concealable stigmas such as sexual orientation). Mental illness can be either visible or concealable, depending on severity (Holmes & River, 1998). Because individuals with visible mental illness (e.g., observable psychotic symptoms) are unlikely to function successfully in a college setting, mental illness in the college context can be generally understood as a concealable stigma. Those living with a concealable stigma regularly face the decision of whether, how, when, and to whom to disclose this aspect of their identity (Chaudoir & Fisher, 2010). Disclosure can be indiscriminate (i.e., coming out to most known contacts) or selective (i.e., only coming out to certain individuals) (Goffman, 1963; Holmes & River, 1998). Making decisions around disclosure of a concealable stigma can be very difficult. Research has shown cost-benefit analyses and Socratic questioning to be effective in facilitating this process (Holmes & River, 1998). Secrecy can be harmful as a coping strategy and disclosure can reduce self-stigma and improve quality of life and psychological well-being (Chaudoir & Fisher, 2010; Corrigan et al., 2010). It is important to note that the literature on disclosure and its benefits is based largely on research with the LGBTQ community (Corrigan, Kosyluk, & Rusch, 2013). However, the same positive effects of disclosure (i.e., reductions in self-stigma) have been observed in people with mental illness as well (Corrigan et al., 2010; Corrigan et al., 2013).

**Honest, Open, Proud**

Several interventions have been designed to address self-stigma in persons living with mental illness. Almost all of these interventions targeting self-stigma have been conducted with adults diagnosed with schizophrenia (Fung, Tsang, & Cheung, 2011; Knight, Wykes, & Hayward, 2006; McCay et al., 2006), with adults diagnosed with a “severe mental illness”
(Macinnes & Lewis, 2008; Roe, Hasson-Ohayon, Mashiach-Eizenberg, Derhy, Lysaker, & Yanos, 2014), with depressed adults (Griffiths, Christensen, Jorm, Evans, & Groves, 2004), and/or in structured settings such as inpatient psychiatric units (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2002; Wieczynski, 2000). One intervention, Coming Out Proud (COP; Corrigan, Kosyluk, & Rüsch, 2013), was more inclusive and enrolled adults living with any self-reported mental illness.

Honest, Open, Proud for college students (HOP-C) is an adaptation of COP designed specifically for college students. HOP-C focuses on reducing self-stigma in college students living with mental illness and aims to empower individuals to make choices regarding disclosure of their mental illness. This is accomplished via peer-led group discussions of potential risks and benefits of disclosure in different settings, what various levels of disclosure might look like, and effective ways to tell one’s story of mental illness in different settings (see Table 1 for more information about the content of HOP-C sessions). Group members have the opportunity to practice disclosure of various levels with one another, share their experiences, and express their concerns. The groups are facilitated by other college students or recent college graduates who have experience with mental illness themselves and who have gone through a rigorous facilitator training.

The current study is the first to evaluate COP/HOP with a college population. To our knowledge, only one prior intervention has specifically targeted self-stigma in college students with mental illness; Wade and colleagues (2011) evaluated the effects of a single session of group therapy on self-stigma related to help-seeking in college students. The intervention successfully reduced self-stigma related to help-seeking, suggesting that brief group interventions may be an effective way to address self-stigma in this population. This study
explored the idea of therapist self-disclosure, but used psychology graduate students as counselors instead of college peers with mental illness. Additionally, this study examined psychological problems/distress more generally and did not address depression and anxiety outcomes specifically.

While the current study is the first to evaluate HOP in a college population, the COP/HOP protocol has demonstrated positive results in other non-college adult populations and in adolescents. A pilot randomized controlled trial found that participating in COP/HOP led to reductions in stigma-related stress, secrecy, and disclosure-related distress, compared to treatment as usual (Rüsch et al., 2014). Participants in this study were 100 adults (mean age = 45.1) who reported at least one current DSM-IV disorder and at least a moderate amount of distress related to disclosure of their mental illness. This pilot study also demonstrated the acceptability of the COP/HOP program and the feasibility of recruiting and retaining adults in the intervention. Depression and anxiety symptoms were not measured as outcomes in this study.

A second randomized controlled trial compared COP/HOP to a waitlist control group and found that the intervention led to reductions in self-stigma, improvements in stigma stress appraisals, and an increase in perceived resources to cope with stigma (Corrigan et al., 2015). Participants in this trial were 126 adults (mean age = 45.6) who identified as having a mental illness or mental health challenges, as well as some shame related to the illness/challenges. This study assessed depression symptoms as an outcome and found that COP/HOP led to a reduction in depression symptoms, though this effect was only significant in female participants and not in males. Anxiety symptoms were not measured. More research is needed to understand the relationship between COP/HOP participation and mental health outcomes in adults.
Finally, a pilot randomized controlled trial of HOP with adolescents compared the HOP intervention plus treatment as usual (HOP + TAU) to TAU alone, and found significant effects on self-stigma, stigma-related stress, quality of life, disclosure-related distress, secrecy, and help-seeking intentions (Mulfinger et al., 2017). Participants in this study were 98 adolescents (age 13-18 years; mean age = 15.8 years) who identified as having a mental illness and reported moderate levels of disclosure-related distress. This study found a large effect on depressive symptoms at 3-week follow-up (but not at post-treatment) and did not assess change in anxiety symptoms. The significant effect on help-seeking intentions further supports the possibility that HOP could be particularly helpful in a college setting where there are many barriers to help-seeking (e.g., Eisenberg et al., 2009).

Participants in the pilot trial of COP/HOP (Rüsch et al., 2014) reported that the group setting and the peer-led component were both major strengths of the intervention. Similarly, participants in the adolescent trial of HOP (Mulfinger et al., 2017) reported that they enjoyed hearing other participants’ stories and that the peer facilitators were inspiring as role models. This reaction is consistent with other accounts of group therapy that emphasize how hearing about other people’s experiences can normalize one’s own mental health challenges and reduce feelings of isolation (e.g., Yalom, 2005). It is also consistent with research demonstrating empirical support specifically for the peer-led component of other group interventions (e.g., Alcoholics Anonymous; Kownacki & Shadish, 1999). Thus, as a peer-led, group-based intervention, HOP-C has the potential to reduce feelings of social isolation and increase feelings of social connection.

**Social Support and Peer Relationships in College Students**

It is well established that social support is associated with better physical and mental
health outcomes. Research suggests that social support both directly improves psychological well-being and acts as a protective factor, or buffer, against adverse outcomes of stress such as the development of mental illness (Kawachi & Berkman, 2001). Because emerging adulthood is a time characterized by difficult transitions and numerous environmental stressors, social support is particularly salient during this developmental period (Lane, 2015). Emerging adults who report having reliable social relationships experience higher levels of psychological well-being and life satisfaction (Lane, 2015).

Emerging adulthood is also a period when peers largely take over from parents as the primary attachment figures in a young person’s life (Swenson, Nordstrom, & Hiester, 2008). For example, an increase in perceived social support from friends, but not family, predicted improved adjustment for first-year college students between the first and second semester (Friedlander et al., 2007). Strong peer attachments during emerging adulthood predict positive development as well as lower levels of depression symptoms. In 17-20 year olds, higher perceived quality of peer attachments was significantly related to greater psychological well-being, particularly self-esteem and life satisfaction, as well as lower depression and anxiety scores (Armsden & Greenberg, 1987). In a large sample of college students (N = 1,378), those who reported lower-quality social support had a sixfold risk of depressive symptoms compared to students with high-quality social support (Hefner & Eisenberg, 2009). In a different sample of college students, perceived availability of social support buffered (i.e., moderated) the relationship between negative life stress and depressive symptoms in college students (Cohen & Hoberman, 1983). Finally, positive social support in college students has been associated with fewer suicidal thoughts and behaviors (Hirsch & Barton, 2011).

Social support also plays a critical role in academic success for college students. Social
adjustment has been identified as “at least as important as academic factors” in predicting student retention (Gerdes & Mallinckrodt, 1994, p. 286). Gloria and Ho (2003) examined three variable sets, including comfort in the university environment, perceived social support, and self-beliefs (e.g., measures of self-efficacy and self-esteem). Perceived social support was identified as the strongest predictor of retention out of the three variable sets (Gloria & Ho, 2003). Other research has similarly found that social support predicts academic performance and retention (Pritchard & Wilson, 2003), as well as satisfaction with one’s college or university (Astin, 1993). Notably, several studies have specifically linked peer social support and/or quality of peer relationships in college with better adjustment outcomes on the Student Adaptation to College Questionnaire, which includes the Institutional Attachment subscale used in the present study (e.g., Cousins, Servaty-Seib, & Lockman, 2017; Friedlander et al., 2007; Swenson, Nordstrom, & Hiester, 2008).

Because social support is linked to better psychological health, stronger academic outcomes, and retention, finding effective ways to improve perceived social support in college students is a critical priority for campus mental health professionals. Peer-led interventions are a promising approach, as there is some evidence that participating in a small peer-led discussion group leads to increased perceived social support in college students. One intervention fitting this description was facilitated by two fellow undergraduates and focused on topics related to the transition to college. Participating in these groups led to greater levels of social adjustment (specifically, less loneliness and greater perceived social support), when comparing participating students to the control group (Mattanah et al., 2010). These results suggest that HOP-C, an intervention with a similar format, could also increase perceived social support in college students.
In college, social support goes beyond interpersonal relationships and can also include institutional support (Lane, 2015). Institutional attachment is defined as commitment to one’s college or university and is commonly used as an outcome to measure adjustment to college (Baker & Siryk, 1984). Previous research has shown institutional attachment to be an important predictor of retention (Gerdes & Mallinckrodt, 1994; Krotseng, 1992; Mann, 2004), making university administrators particularly interested in this outcome. Institutional attachment can also be understood as a sense of belonging or connectedness to one’s community, and higher reported institutional attachment is associated with greater psychological well-being in college students (Love et al., 2009).

While institutional attachment has been shown to predict retention and psychological well-being, it is primarily measured as an outcome in the adjustment literature. For example, previous research has found that higher levels of perfectionism (Mann, 2004), academic and social stress (Solberg, Valdez, & Villerreal, 1994), and social anxiety (Nordstrom, Goguen, & Hiester, 2014) predict lower institutional attachment. Conversely, stronger institutional attachment has been linked to participation in athletics (Melendez, 2006) and pre-orientation camping programs (Bobilya, Akey, & Mitchell, 2009). The latter findings suggest that participating in group-based activities sponsored by, or at least affiliated with, the university could increase institutional attachment. Notably, close peer relationships at college have been shown to predict stronger institutional attachment as well (Swenson, Nordstrom, & Hiester, 2008), suggesting that improving relationships with college peers could improve attachment to the university itself.
The Present Study

Due to the increasing numbers of college students with mental illness, there is an urgent need for the development of feasible and cost-effective alternatives to campus counseling centers. The present study examined outcomes and mechanisms of the Honest, Open, Proud intervention for college students. Depression and anxiety symptoms were examined because these are the two most common emotional concerns among college students. In order to understand mechanisms of change, the current study also investigated the mediating roles of (1) relationship satisfaction with college peers, and (2) institutional attachment, in the relation between HOP-C participation and mental health outcomes (see Figure 1). Data were collected at three time points: before the intervention (T1), after the intervention (T2), and after a booster session three weeks later (T3).

Aim 1: Examine the direct relationship between intervention and symptoms of depression and anxiety.

Hypothesis 1. Controlling for baseline depression symptoms, HOP-C participants will have lower depression scores than control group participants at the post-booster assessment (T3).

Hypothesis 2. Controlling for baseline anxiety symptoms, HOP-C participants will have lower anxiety scores than control group participants at the post-booster assessment (T3).

Aim 2: Examine the direct relationship between intervention and institutional attachment.

Hypothesis 3. Controlling for baseline institutional attachment, HOP-C participants will have higher institutional attachment than control group participants at the post-intervention assessment (T2).

Aim 3: Examine mediators of the relationships in Aim 1 and 2.

Hypothesis 4. Relationship satisfaction with peers will partially mediate the relationship
between intervention and institutional attachment, such that being in the HOP-C group will predict more relationship satisfaction with friends at college at T2, which will predict stronger institutional attachment at T2.

**Hypothesis 5.** Institutional attachment will partially mediate the relationship between intervention and depression and anxiety symptoms, such that being in the HOP-C group will predict stronger institutional attachment at T2, which will predict fewer depression and anxiety symptoms at T3.

**Hypothesis 6.** The overall serial mediation model will be significant, such that being in the HOP group will predict more relationship satisfaction with friends at college at T2, which will predict stronger institutional attachment at T2, which will predict fewer symptoms of depression and anxiety at T3.

![Figure 1. Proposed serial mediation model](image)
CHAPTER THREE

METHODS

Participants

The present study analyzes data from university students (N=108) who participated in the Honest, Open, Proud for college students (HOP-C) study across three college campuses between Spring 2016 and Spring 2018.

The initial sample included 118 students, from across three universities, who were enrolled in the study and randomized to a study condition. However, because the hypotheses for this project were strongly grounded in emerging adulthood theory, participants outside of that developmental period (those 26 and older) were excluded from analyses. This reduced the sample to 108 participants aged 18-25 (M = 19.61 years, SD = 1.76) who identified themselves as currently-enrolled students living with mental illness. Some of these remaining participants (N=9) identified their current education status as graduate students. To maximize sample size, graduate students aged 25 and younger were included in analyses.

Of the 108 participants in the final sample, 87.0% (N=94) identified as female, 11.1% (N=12) as male, and 1.9 (N=2) as transgender. 63.9% (N=69) identified as heterosexual, 20.4% (N=22) as bisexual, 7.5% (N=8) as gay or lesbian, and 8.4% (N=9) as other. With regards to ethnicity, 17.6% (N=19) identified as Hispanic/Latino. When reporting race, participants were instructed to select all that apply; 70.4% (N=76) identified as White, 15.7% (N=17) as Asian, 7.4% (N=8) as Black or African-American, 0.9% (N=1) as American Indian/Alaskan Native,
0.9% (N=1) as Native Hawaiian or Pacific Islander, and 7.4% (N=8) as other. The sample included 45 first-year undergraduates (41.7%), 24 second-year undergraduates (22.2%), 21 third-year undergraduates (19.4%), 9 fourth-year undergraduates (8.3%), and 9 graduate students (8.3%). 84.3% (N = 91) of participants had previously received treatment for mental health challenges via psychotherapy/counseling and 65.7% (N = 71) via medication. At the start of the study (T1), 44.4% (N = 48) of participants were currently in psychotherapy/counseling for mental health challenges and 58.3% (N = 63) were currently taking medication for mental health challenges. The final sample included 59 participants randomized to HOP-C (54.6%) and 49 participants randomized to a control group (45.4%).

**Procedure**

See Appendix A for a detailed description of how methods differed across study sites.

**Recruitment**

Participants were recruited via flyers, emails to relevant student groups / listservs, social media sites, various on-campus offices, and in-person tabling. Recruitment materials advertised a research opportunity for college students dealing with mental health challenges. Flyers read: “Are you a college student who identifies as having a mental illness and worries about telling others?” and included information about the nature of the study, the time commitment, and options for compensation. Interested students were encouraged to contact study personnel via phone or email.

Inclusion/exclusion criteria were assessed during a phone screen, a brief online survey, or via email. Inclusion criteria included being a college student aged 18 or older who identifies as having a mental illness or mental health challenge. Potential participants were not asked to present proof of a formal diagnosis, as many emerging adults who live with mental illness,
particularly those who experience high levels of self-stigma, do not seek professional help (Eisenberg et al., 2009). One campus included the exclusion criterion of having substance use as the only mental health concern. While participants may have had comorbid substance use issues, the HOP intervention was not designed for individuals whose primary concern is substance use.

Peer facilitators were recruited from relevant student groups and via email listservs. During the second year of the study, peer facilitators were also recruited from the pool of previous study participants. Each year of the study, a faculty- or graduate-level researcher interviewed applicants and chose two co-facilitators who had lived experience with mental illness and who also demonstrated the leadership qualities and clinical skills necessary to facilitate HOP-C groups. Facilitator training took place over two days, and was led by study personnel at the National Alliance on Mental Illness and/or at the Illinois Institute of Technology. The first day of training (six to eight hours) involved participating in all four sessions of the HOP-C program in order to understand the structure of the intervention and better empathize with participants. The second day of training (four to eight hours) covered topics specifically related to facilitation such as confidentiality, self-disclosure, use of sensitive language, and risk assessment. Any peer facilitators who had previously participated in the study as a HOP-C participant only attended the second day of training.

**Consent, Randomization, and Scheduling**

Informed consent and randomization varied across the three campuses. At one campus, once enough participants for at least one HOP-C group (four to eight participants) and an equally sized control group were recruited, an in-person consent session was scheduled. During the session, a graduate-level researcher distributed consent forms approved by the local Institutional Review Board and explained details about the study procedure, compensation, and potential risks
and benefits of participation. After signing consent forms that corresponded to their chosen type of compensation (research credit or gift cards), participants were assigned to either the HOP-C group or the control group via shuffled note cards that had either “HOP” or “Questionnaire” written on them. The second campus used an online consent form and randomized students into study conditions using an online random number generator. At the third campus, participants were consented in person by a faculty member immediately before the first HOP-C session, and students were randomized into their study condition via coin toss.

Participants who were randomized into the HOP-C group were contacted via email shortly after the consent session about when and where group sessions would take place. Depending on how many participants were recruited each semester, the corresponding number of groups were scheduled to ensure four to eight participants in each group. Survey links were sent out to both HOP-C participants and control participants before the intervention started (T1), within three days of the third session (T2) and within three days of the booster session (T3; see Table 1 for a timeline of sessions and assessments). Participants were given three to six days to complete each survey; the exact window of time varied by semester and by campus.

Two campuses used a waitlist control design. At the other campus, control participants were offered the opportunity to participate in a HOP-C group when it was next offered without completing questionnaires or receiving compensation (i.e., they would not be participants in the trial again). This ensured that any student who wanted to participate in the HOP-C intervention eventually had the opportunity to do so.

**Honest, Open, Proud Protocol**

At two campuses ($N = 92$ combined), HOP-C sessions were about two hours long, once a week, for three consecutive weeks, with a fourth booster session three weeks after the third
session. At the third campus ($N = 16$), the HOP-C content was condensed into two sessions, with a third booster session two weeks after the second session; this was done to improve attendance and retention. The HOP-C manual and workbook are publicly available here: http://www.comingoutproudprogram.org/index.php/coming-out-proud-on-college-campuses. All HOP-C group participants received a copy of the workbook to keep. While the full manual can be found at the link above, Table 1 describes the major content of each session. Peer facilitators completed fidelity checklists to track adherence to the HOP-C protocol. Fidelity was computed as a percentage of checklist items completed. Fidelity ranged from 87%-100%, with a mean adherence rate of 93.5%.

It is important to emphasize that HOP-C participants were not pressured to disclose anything about their experience with mental illness if they did not feel comfortable doing so (both within the group and with regards to disclosure outside of the group). Ultimately, the decision to “come out” lies solely with the individual. The goal of HOP-C is not to have all participants disclose their experience to everyone in their life by the final session. Rather, the goal is to reduce self-stigma by facilitating discussions with peers, to give participants a space to express their thoughts about the idea of disclosure, and to practice how they might tell their story if they choose to do so. Additionally, while HOP-C materials use the term “mental illness,” the participant workbook acknowledges that this term may not resonate with all people and encourages participants to “consider how they like to label their experiences leading to stigma: mental illness, mental health challenge, or other term” (Al-Khouja, Corrigan, & Nieweglowski, 2015, p. 5).
Table 1. Overview of HOP-C Sessions and Assessments

<table>
<thead>
<tr>
<th>Assessment or Session</th>
<th>Description of Assessment or Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Intervention Assessment (T1)</td>
<td>Participants complete a demographic questionnaire and study battery within 2 weeks of randomization, prior to starting intervention.</td>
</tr>
<tr>
<td>Session 1: Consider the Pros and Cons of Disclosing</td>
<td>Discussion of what it means to identify as a person with mental illness; helping participants weigh the potential costs and benefits of disclosure, with the acknowledgement that these costs and benefits may vary across settings.</td>
</tr>
<tr>
<td>Session 2: There are Different Ways to Disclose (This content was divided between Session 1 and 2 for the campus with a condensed protocol.)</td>
<td>Teaching different ways of disclosing, including a discussion of social media disclosure, while acknowledging that some strategies are safer than others; discussion about deciding to whom one could disclose and how those individuals might respond.</td>
</tr>
<tr>
<td>Session 3: Telling Your Story (This was covered in Session 2 for the campus with a condensed protocol)</td>
<td>Each participant crafts their own personal disclosure story including elements of both challenges and triumphs; giving participants the opportunity to practice telling their story.</td>
</tr>
<tr>
<td>Post-Intervention Assessment (T2)</td>
<td>Participants complete study battery within one week of Session 3.</td>
</tr>
<tr>
<td>Session 4: Booster (3 weeks after Session 3; 2 weeks after Session 2 for condensed protocol)</td>
<td>Check-in about whether participants chose to disclose since the last group session, how these decisions were made, and how it went for those who did; revisiting the original cost-benefit analysis and the crafting of disclosure stories.</td>
</tr>
<tr>
<td>Post-Booster Assessment (T3)</td>
<td>Participants complete study battery within one week of Booster session.</td>
</tr>
</tbody>
</table>

**Measures**

**Demographic Variables**

Information on age, gender, sexual orientation, ethnicity, race, relationship status, level of
education, and current housing was collected at the first time point. Participants were also asked if they had previously received, or were currently receiving, treatment (including psychotherapy/counseling and medication) for mental health challenges. Measures were added in Spring 2018 asking participants to give their current diagnosis or diagnoses and asking participants about their disclosure behavior, and their satisfaction with that behavior, in the past month. Unfortunately, these measures were only included at T2 and T3 (at one campus) and only at T3 (at a second campus), so intervention effects on actual disclosure behavior could not be examined. Additionally, because these two measures were added in the last semester of the study, this information was collected from a small minority of the total sample (15 participants at T2 and an additional 4 participants at T3).

**Depression Symptoms**

Depression symptoms were assessed using the Center for Epidemiologic Studies Short Depression Scale 10 (CES-D 10; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993; see Appendix B), a 10-item version of the CES-D (Radloff, 1977) that has been validated as a good indicator of depression symptom severity in a psychiatric sample (Björgvinsson, Kertz, Bigda-Peyton, McCoy, & Aderka, 2013) and has demonstrated good construct validity in a college-aged sample (Bradley, Bagnell, & Brannen, 2010). Items are scored from 0 (rarely or none of the time) to 3 (all of the time), based on how participants have felt over the past week. Sample items include “I felt lonely” and “I could not ‘get going’.” The scale yielded adequate reliability in the current sample ($\alpha = .80$).

**Anxiety Symptoms**

Anxiety symptoms were assessed using the Generalized Anxiety Disorder 7-item Scale (GAD-7; Spitzer, Kroenke, Williams, & Lowe, 2006; see Appendix B). The GAD-7 has
demonstrated good validity and reliability in the general population (Löwe, et al., 2008) and in a psychiatric sample (Kertz, Bigda-Peyton, & Bjorgvinsson, 2013). Items are scored from 0 (not at all) to 3 (nearly every day), based on how participants have felt over the past two weeks. Sample items include “feeling nervous, anxious, or on edge” and “not being able to stop or control worrying.” The scale yielded adequate reliability in the current sample ($\alpha = .89$).

**Peer Relationship Satisfaction**

Participants’ satisfaction with peers at college was assessed using a composite score of two items on a Relationship Satisfaction and Availability scale created by research personnel for this study (see Appendix B). These items were based on a similar scale measuring relationship satisfaction developed for a previous study (Conley, Travers, & Bryant, 2013). The scale asks participants to rate various categories of people on two different dimensions; the present study will focus on friends at college. The two items are, “How satisfied are you, overall, with friends at [College Name]?” and “To what degree can you contact or otherwise interact with friends at [College Name] when in need?” Both items are scored from 1 (not at all) to 5 (very much). While there has been debate over how to assess reliability of a two-item scale, Eisinga, Grotenhus, and Pelzer (2013) recommend using Cronbach’s alpha over other alternatives such as a Pearson correlation. In the current sample, these items yielded adequate reliability ($\alpha = .74$).

**Institutional Attachment**

Participants’ attachment to their college/university was assessed using the 15-item Institutional Attachment subscale of the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1984; see Appendix B). The SACQ is a widely used measure with good construct validity (Feldt, Grahm, & Dew, 2011) and predictive validity for academic outcomes and attrition (Beyers & Goossens, 2002). Items are rated on a scale of 1 (applies to me very closely)
to 9 (doesn’t apply to me at all). Sample items include “I feel that I fit in well as part of the
college environment” and “I am pleased now about my decision to attend this college in
particular.” The scale yielded adequate reliability in the current sample (α = .86).
CHAPTER FOUR

RESULTS

Data Cleaning

Because data were collected separately at three schools, there was some variation in
survey question order (e.g., occasionally two items on a measure were presented in reverse order
at one campus due to human error in survey creation), response options (e.g., the addition of a
“prefer not to answer” option for all demographics at one campus), and data values (e.g., “N/A”
coded as 0 for one campus and blank/missing for others). Thus, all data, including original
surveys from each campus, were thoroughly reviewed by multiple research personnel and all
variations between schools were addressed to ensure consistency in the dataset. Several cases of
duplicate and missing data arose from participants mis-entering their ID number and/or taking a
survey multiple times at one or more time point. In these cases, ID numbers and demographics
were carefully matched up to ensure that data were accurate and complete for each participant; in
cases of multiple responses to the same survey, the most complete or most recent version was
used. The data were examined for missing values; means and totals were computed if a
participant responded to at least 80% of the items on a given measure. The data were then
examined for skewness. Variables were considered skewed if the skewness value was greater
than 1.0 or less than -1.0 (Tabachnick & Fidell, 2013). Using this standard criterion for
skewness, none of the variables of interest were skewed and no data transformation was needed.
Participants who did not complete surveys at T2 and/or T3 were not included in analyses using
data from that particular time point. Thus, the full sample of 108 could not be included in the longitudinal analyses of the current study. The number of participants included in each analysis is listed below.

**Preliminary Analyses**

At baseline, participants randomized to the HOP group (N = 59) did not differ from those randomized to the control group (N = 49) in age, t (106) = .323, p = .747, gender, \( \chi^2(2) = .139, p = .933 \), sexual orientation, \( \chi^2(5) = 2.319, p = .803 \), or current level of education, \( \chi^2(5) = 1.684, p = .891 \). There were no significant differences between the groups in whether participants were currently receiving mental health treatment via psychotherapy/counseling, \( \chi^2(1) = .007, p = .931 \), or medication, \( \chi^2(1) = .385, p = .535 \). Participants randomized to the HOP group did differ from those randomized to the control group in race/ethnicity minority status, \( \chi^2(1) = 4.020, p = .045 \), such that the HOP group had a higher ratio of White to non-White participants than the control group. For this reason, all analyses were run with race/ethnicity in the first step of regression models and as a statistical control in mediation models, to ensure that any differences observed between groups were not due to differences in ethnic or racial make-up of the two groups.

Participants who completed surveys at all three time points (N = 86) did not differ from those who completed surveys at only one or two time points (N = 22) in age, t (106) = -.467, p = .641, gender, \( \chi^2(2) = .661, p = .719 \), sexual orientation, \( \chi^2(5) = 4.305, p = .506 \), race/ethnicity minority status, \( \chi^2(1) = .032, p = .858 \), current level of education, \( \chi^2(5) = 5.046, p = .410 \). Study completers vs. non-completers also did not differ in whether they were currently receiving mental health treatment via psychotherapy/counseling, \( \chi^2(1) = .731, p = .393 \), or medication, \( \chi^2(1) = .007, p = .936 \). Thus, the demographic profile of the full sample applies to the
subsamples included in each analysis. Additionally, participants randomized to the HOP group did not differ from those randomized to the control group on any variable of interest (see Table 2 for group means and Table 3 for correlation matrix).

Table 2. Descriptive Statistics by Group

<table>
<thead>
<tr>
<th>Measure</th>
<th>All</th>
<th></th>
<th></th>
<th>All</th>
<th></th>
<th></th>
<th>Control</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>M</td>
<td>SD</td>
<td>n</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>RSA (T1)</td>
<td>108</td>
<td>6.98</td>
<td>2.10</td>
<td>59</td>
<td>7.03</td>
<td>1.86</td>
<td>49</td>
<td>6.92</td>
<td>2.38</td>
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<td>2.16</td>
<td>50</td>
<td>7.26</td>
<td>1.90</td>
<td>48</td>
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<td>2.42</td>
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<tr>
<td>RSA (T3)</td>
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<td>2.03</td>
<td>46</td>
<td>7.41</td>
<td>1.73</td>
<td>43</td>
<td>6.95</td>
<td>2.31</td>
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<tr>
<td>SACQ-IA (T1)</td>
<td>108</td>
<td>95.59</td>
<td>21.26</td>
<td>59</td>
<td>96.71</td>
<td>22.28</td>
<td>49</td>
<td>94.25</td>
<td>20.11</td>
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<td>23.41</td>
<td>49</td>
<td>94.71</td>
<td>24.03</td>
<td>49</td>
<td>92.67</td>
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<td>98.39</td>
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<td>46</td>
<td>99.95</td>
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<td>43</td>
<td>96.72</td>
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<tr>
<td>CESD-10 (T1)</td>
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<td>59</td>
<td>16.49</td>
<td>5.62</td>
<td>49</td>
<td>16.39</td>
<td>6.03</td>
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<tr>
<td>CESD-10 (T2)</td>
<td>98</td>
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<td>6.93</td>
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<td>15.59</td>
<td>6.65</td>
<td>49</td>
<td>15.57</td>
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<tr>
<td>CESD-10 (T3)</td>
<td>89</td>
<td>14.71</td>
<td>7.13</td>
<td>46</td>
<td>15.13</td>
<td>6.78</td>
<td>33</td>
<td>14.26</td>
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<tr>
<td>GAD-7 (T1)</td>
<td>108</td>
<td>12.78</td>
<td>5.29</td>
<td>59</td>
<td>12.00</td>
<td>5.16</td>
<td>49</td>
<td>13.71</td>
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<td>GAD-7 (T2)</td>
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<tr>
<td>GAD-7 (T3)</td>
<td>89</td>
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<td>5.85</td>
<td>46</td>
<td>11.28</td>
<td>5.31</td>
<td>43</td>
<td>11.89</td>
<td>6.43</td>
</tr>
</tbody>
</table>

*Note. Independent samples t-tests were run to examine differences between group means; there were no significant differences between group means on any of these variables at any time point. RSA = Relationship satisfaction with college peers; SACQ-IA = Institutional attachment; CESD-10 = Depression symptoms; GAD-7 = Anxiety symptoms.*

**Power Analysis**

For a power of .80, when utilizing percentile bootstrapping methodology to test a mediation model, a sample size of 36 is needed to detect large effect sizes, a sample size of 78 is needed to detect medium effect sizes, and a sample size of 558 is needed to detect small effect sizes (Fritz & MacKinnon, 2007). Thus, with a sample size of 108, this study is powered to detect a medium effect size. Given that this study is under-powered to detect a small effect using
Table 3. Correlation Matrix for Variables of Interest

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. RSA - College Peers (T1)</td>
<td>--</td>
<td>.73*</td>
<td>.74*</td>
<td>.41*</td>
<td>.39*</td>
<td>.41*</td>
<td>- .35*</td>
<td>- .34*</td>
<td>- .31*</td>
<td>- .06</td>
<td>- .19</td>
<td>- .03</td>
</tr>
<tr>
<td>2. RSA - College Peers (T2)</td>
<td>.66*</td>
<td>--</td>
<td>.80*</td>
<td>.37*</td>
<td>.46*</td>
<td>.57*</td>
<td>- .22</td>
<td>- .31*</td>
<td>- .20</td>
<td>.00</td>
<td>- .16</td>
<td>- .01</td>
</tr>
<tr>
<td>3. RSA - College Peers (T3)</td>
<td>.73*</td>
<td>.75*</td>
<td>--</td>
<td>.39*</td>
<td>.41*</td>
<td>.54*</td>
<td>- .46*</td>
<td>- .48*</td>
<td>- .46*</td>
<td>- .16</td>
<td>- .38*</td>
<td>- .17</td>
</tr>
<tr>
<td>4. Institutional Attachment (T1)</td>
<td>.68*</td>
<td>.51*</td>
<td>.56*</td>
<td>--</td>
<td>.85*</td>
<td>.85*</td>
<td>- .29*</td>
<td>- .32*</td>
<td>- .37*</td>
<td>.05</td>
<td>- .14</td>
<td>- .14</td>
</tr>
<tr>
<td>5. Institutional Attachment (T2)</td>
<td>.58*</td>
<td>.65*</td>
<td>.67*</td>
<td>.82*</td>
<td>--</td>
<td>.86*</td>
<td>- .24</td>
<td>- .39*</td>
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<td>.05</td>
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<tr>
<td>6. Institutional Attachment (T3)</td>
<td>.55*</td>
<td>.62*</td>
<td>.73*</td>
<td>.77*</td>
<td>.92*</td>
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<td>- .31*</td>
<td>- .36*</td>
<td>- .37*</td>
<td>- .03</td>
<td>- .21</td>
<td>- .06</td>
</tr>
<tr>
<td>7. Depression (T1)</td>
<td>- .33*</td>
<td>- .26</td>
<td>- .31*</td>
<td>- .44*</td>
<td>- .50*</td>
<td>- .43*</td>
<td>--</td>
<td>.83*</td>
<td>.70*</td>
<td>.62*</td>
<td>.67*</td>
<td>.36*</td>
</tr>
<tr>
<td>8. Depression (T2)</td>
<td>- .20</td>
<td>- .28</td>
<td>- .29</td>
<td>- .37*</td>
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<td>.71*</td>
<td>.55*</td>
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<tr>
<td>9. Depression (T3)</td>
<td>- .38*</td>
<td>- .32*</td>
<td>- .50*</td>
<td>- .38*</td>
<td>- .59*</td>
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<td>--</td>
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<td>--</td>
<td>.33*</td>
<td>.51*</td>
</tr>
<tr>
<td>10. Anxiety (T1)</td>
<td>- .30*</td>
<td>- .31*</td>
<td>- .37*</td>
<td>- .34*</td>
<td>- .48*</td>
<td>- .48*</td>
<td>.78*</td>
<td>--</td>
<td>.68*</td>
<td>.69*</td>
<td>--</td>
<td>.77*</td>
</tr>
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<td>11. Anxiety (T2)</td>
<td>- .26</td>
<td>- .38*</td>
<td>- .41*</td>
<td>- .34*</td>
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<td>.75*</td>
<td>--</td>
<td>.83*</td>
<td>.79*</td>
<td>--</td>
<td>.78*</td>
</tr>
<tr>
<td>12. Anxiety (T3)</td>
<td>- .18</td>
<td>- .26</td>
<td>- .38*</td>
<td>- .24</td>
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<td>--</td>
<td>.76*</td>
<td>.83*</td>
<td>--</td>
<td>.67*</td>
</tr>
</tbody>
</table>

Note. Correlations for HOP-C group are above the diagonal; correlations for control group are below the diagonal.

* p < .05, ** p < .01
statistical significance, effect sizes are reported in addition to $p$-values for any results that are significant or approaching significance. Effect sizes are reported with $\Delta R^2$, which represents the additional variability in the dependent variable explained by adding the variable of interest into the model after any statistical controls (i.e., baseline levels of the construct and race/ethnicity). Effect sizes are interpreted using Cohen’s (1988) guidelines: $R^2 \geq .01$ for a small effect, $R^2 \geq .09$ for a medium effect, and $R^2 \geq .25$ for a large effect.

**Primary Analyses**

**Aim 1**

**Hypothesis 1.** A hierarchical linear regression was used to test the direct relationship between intervention group (HOP-C vs. control) at T1 and depression symptoms at T3, adjusting for depression symptoms at T1 in the first step of the model. Results ($N = 89$) indicate no significant effect of the intervention on depression symptoms at T3, $\beta = -.016$, $p = .833$. Because no effect was found on depression symptoms at T3, intervention effects on depression symptoms at T2 were also examined. This further analysis ($N = 98$) similarly indicates no significant effect of the intervention on depression symptoms at T2, $\beta = -.006$, $p = .925$.

**Hypothesis 2.** A hierarchical linear regression was used to test the direct relationship between intervention group (HOP-C vs. control) at T1 and anxiety symptoms at T3, adjusting for anxiety symptoms at T1 in the first step of the model. Results ($N = 89$) indicate no significant effect of the intervention on anxiety symptoms at T3, $\beta = -.030$, $p = .752$. Further analysis ($N = 98$) similarly indicates no significant effect of the intervention on anxiety symptoms at T2, $\beta = -.073$, $p = .278$.

**Aim 2**

**Hypothesis 3.** A hierarchical linear regression was used to test the direct relationship
between intervention group (HOP-C vs. control) at T1 and institutional attachment at T2, adjusting for institutional attachment at T1 in the first step of the model. Results \((N = 98)\) indicate no significant effect of the intervention on institutional attachment at T2, \(\beta = .005, p = .930\).

**Aim 3**

All mediation models were tested using Preacher and Hayes’ (2008) bootstrapping method in the PROCESS macro in SPSS. Bootstrapping reduces the risk of Type II errors and is less conservative than other mediation methods (Preacher & Hayes, 2008), making it the preferred approach. Because standardized beta coefficients \((\beta)\) are reported for all regressions, confidence intervals for the standardized (not unstandardized) indirect effects are reported for all proposed mediation models. See Figure 2 for all \(\beta\) and \(p\) values in the hypothesized model.

**Hypothesis 4.** First, the indirect effect of intervention group on institutional attachment at T2 via relationship satisfaction with college peers at T2 was examined \((N = 97)\). T1 levels of the outcome variable (institutional attachment) were accounted for in the model. Relationship satisfaction with college peers at T2 did not significantly mediate the relation between intervention group and institutional attachment at T2, with a 95% CI \((- .11, .06)\). Examining each individual path of this mediation model separately, intervention group did not significantly predict relationship satisfaction with college peers at T2, \(\beta = .000, p = .996\). However, relationship satisfaction with college peers at T2 did predict institutional attachment at T2, adjusting for baseline levels of institutional attachment, \(\beta = .232, p < .001\), such that higher relationship satisfaction with college peers was associated with stronger institutional attachment. \(\Delta R^2 = .04\), indicating a small-to-medium effect size. This relationship held true over time, with higher relationship satisfaction with college peers at T2 predicting stronger institutional attachment.
attachment at T3, adjusting for T2 levels of institutional attachment, $\beta = .147$, $p = .015$. $\Delta R^2 = .02$, indicating a small effect size.

**Hypothesis 5, part 1.** The indirect effect of intervention group on depression symptoms at T3 via institutional attachment at T2 was examined ($N = 86$). T1 levels of the outcome variable (depression symptoms) were accounted for in the model. Institutional attachment at T2 did not significantly mediate the relation between intervention group and depression at T3, with a 95% CI (-.07, .06). Examining each pathway of this mediation model separately, intervention group did not significantly predict institutional attachment at T2 (see Hypothesis 3), but institutional attachment at T2 significantly predicted depression symptoms at T3, $\beta = -.200$, $p = .013$, such that stronger institutional attachment at T2 was associated with lower depression scores at T3. $\Delta R^2 = .03$, indicating a small effect size.

**Hypothesis 5, part 2.** The indirect effect of intervention group on anxiety symptoms at T3 via institutional attachment at T2 was examined ($N = 86$). T1 levels of the outcome variable (anxiety symptoms) were accounted for in the model. Institutional attachment at T2 did not significantly mediate the relation between intervention group and anxiety at T3, with a 95% CI (-.09, .02). Examining each pathway of this mediation model separately, intervention group did not significantly predict institutional attachment at T2 (see Hypothesis 3) and institutional attachment at T2 did not significantly predict anxiety symptoms at T3, $\beta = -.126$, $p = .202$.

**Hypothesis 6.** The proposed serial mediation model was tested to examine the mediation pathway from intervention group to depression symptoms and anxiety symptoms at T3, separately, via relationship satisfaction with college peers at T2 and institutional attachment at T2. The significance of the overall model was tested using a model template (Model 6) in the PROCESS macro. The overall model ($N = 85$) was nonsignificant for depression symptoms at
T3, with a 95% CI (-.03, .04). The overall model ($N = 85$) was also nonsignificant for anxiety symptoms at T3, with a 95% CI (-.09, .02).

Figure 2. Serial mediation model with $\beta$ and $p$ values
CHAPTER FIVE

DISCUSSION

A recent increase in the number of college students living with mental illness has created a strain on college counseling centers and left university administrators struggling with how to address the needs of this population (Salzer, 2012). While the demand for mental health services on college campuses has continued to rise over recent years (CCMH, 2017), college students continue to face many barriers to treatment, including stigma (Eisenberg et al., 2009). Previous research has examined the effects of the Honest, Open, Proud (HOP) intervention with adults (Corrigan et al., 2015; Rüsch et al., 2014) and adolescents (Mulfinger et al., 2017) with self-identified mental illness. This was the first study to evaluate HOP with a college sample. The peer-led group-based structure of this intervention may be particularly suited to college students, due to the important role of peer support during emerging adulthood (Swenson et al., 2008) and within the college context specifically (Gerdes & Mallinckrodt, 1994; Gloria & Ho, 2003). This study also expands upon the knowledge base about HOP by examining outcomes that were not measured in previous trials of HOP, including anxiety symptoms and relational factors specific to college students. This study examined the effect of HOP-C participation on satisfaction with college peers, institutional attachment, depression symptoms, and anxiety symptoms, as well as hypothesized mediating relationships among these variables.

Results indicate that participating in the HOP-C intervention did not predict greater relationship satisfaction with college peers or stronger institutional attachment. Further, the
HOP-C intervention does not appear to predict lower depression symptoms or anxiety symptoms in college students. One explanation for these null results could be the content and focus of the intervention itself. The HOP-C intervention does not explicitly target any of the outcomes or mediators examined in the current study. Rather, it specifically targets self-stigma and disclosure-related self-efficacy. Although an in-depth discussion of these outcomes is beyond the scope of this thesis, it is worth noting that the intervention did have a significant effect on these targeted variables. Specifically, participating in HOP-C, compared to the control group, predicted lower self-stigma, lower stigma-related stress, and higher disclosure-related self-efficacy (Hundert, Conley, & Corrigan, 2018; Conley et al., manuscript in preparation). Thus, the intervention had its intended primary effects, but did not have the secondary effects hypothesized in the current study.

The null finding regarding the relationship between HOP-C participation and depression symptoms is surprising in the context of a recent trial piloting HOP with a sample of adolescents (Mulfinger et al., 2017). Mulfinger and colleagues found a large effect on depressive symptoms at 3-week follow-up. Interestingly, no effect was seen at post-treatment, suggesting a delayed effect on depression symptoms. The current study examined depression symptoms at T3 (post-booster session), and it is possible that a similar delayed effect on depression symptoms would be found at a later time. Additionally, there are important differences between the current study and the study of HOP with adolescents. Almost all adolescent participants were recruited from inpatient psychiatric settings, implying more severe psychopathology (associated with more self-stigma; Holmes & River, 1998) than the majority of the college students in the current study. Additionally, an inclusion criterion for the trial with adolescents was “at least a moderate level of self-reported disclosure-related distress” (Mulfinger et al., 2017, p. 2) and the researchers note
that this was the most common reason for ineligibility. The current study did not employ this
criterion, representing a key difference between the two samples that could affect response to
HOP-C.

The null findings regarding the relationship between HOP-C participation and
institutional attachment is somewhat surprising in the context of research demonstrating that
participation in other group-based activities on college campuses is associated with stronger
institutional attachment (Bobilya et al., 2009; Kim, Liu, & Shan, 2017; Melendez, 2006).
However, there are key differences between HOP-C and the group-based activities examined in
prior studies. First, Bobilya and colleagues (2009) evaluated a spiritually-focused orientation
program involving a 12-day camping trip and follow-up meetings throughout the first semester
of college. This intervention was similar to HOP-C in that a small group of students met over
multiple time points and had the opportunity to build a sense of community and trust with one
another. However, the content of the group was very different from HOP-C with a focus on
spirituality and adjustment to college.

In general, there are very few studies examining institutional attachment as the outcome
of an intervention; primarily, it is used as a predictor of retention. When institutional attachment
is examined as an outcome, it is usually in the context of college-based activities, not
interventions. For example, multiple studies have linked athletic participation to institutional
team involves group-based work with other students at one’s institution; beyond this aspect, it
has little in common with participation in a peer-led mental health-focused intervention.
Additionally, athletics in a college context are usually explicitly connected to, and sponsored by,
the institution. While HOP-C was not explicitly sponsored by “the institution” at each school, the
group sessions were conducted on each respective campus, organized by institution-affiliated research labs, and in some cases received additional institutional support (e.g., advertising for the study in the student counseling center and other student services offices, instructors offering course credit for participation). Despite some connection to each university, the HOP-C protocol discusses life as a college student generally, and is not designed to be institution-specific. This makes the protocol applicable to a wide range of campuses, but also means that the particular institution may not be salient in the intervention (unlike the salience of the institution during an orientation program, for example), and thus attachment to that institution may not be impacted.

While analyses examining HOP-C as a predictor (Aim 1 and Aim 2) reveal null results, close examination of mediation hypotheses (Aim 3) elucidates important relationships among other variables of interest. First, relationship satisfaction with college peers at T2 significantly predicted institutional attachment at T2 and T3. This is consistent with previous research demonstrating that peer social support and/or quality of peer relationships in college predict stronger institutional attachment (Cousins et al., 2017; Swenson et al., 2008). It is not surprising that feelings of belonging at a particular school follow from social connections to peers at that school. The second important finding was that institutional attachment at T2 significantly predicted depression symptoms at T3. While institutional attachment has been tied to well-being more generally (particularly in minority populations; Love et al., 2009), this is the first study, to our knowledge, to demonstrate a predictive relationship between institutional attachment and depression symptoms in college students. This is an important addition to the college student mental health literature, as these results suggest that fostering stronger attachment to a college or university could reduce depression symptoms in its students.
Strengths, Limitations, and Future Directions

This study employed a rigorous research design, including randomization and a longitudinal design with multiple time points. This allowed for a thorough evaluation of intervention effects, taking into account baseline characteristics of each group. Additionally, having three time points allowed for more appropriate mediation analyses. However, while the post-booster session time point could be considered a “follow-up,” a longer follow-up assessment would have allowed for a better examination of long-term effects of participation in HOP-C. This is particularly indicated in the context of previous findings that HOP reduced depression symptoms at 3-week follow-up but not at immediate post-intervention (Mulfinger et al., 2017). Unfortunately, while one campus included a one-month follow-up assessment, the other two campuses did not include a follow-up assessment and thus long-term effects cannot be examined for the entire study sample. Future studies evaluating HOP-C should include longer periods of follow-up in order to evaluate long-term outcomes of the intervention as well as short-term effects. Another limitation related to the research design is that this study is underpowered to detect small effects with significance testing. A larger sample may have allowed for the detection of smaller effects with significance testing.

A strength of this study is the use of data collected across three college campuses. Each campus is quite different demographically (see Appendix A) and these results are therefore generalizable to a wide range of college students. However, it should be noted that the overwhelming majority of participants were from Campus 1. Additionally, while collecting data across three campuses improves the generalizability of these results, it also introduced a substantial amount of variability in the study methods (see Appendix A). For example, two campuses included graduate students in their samples and one campus did not. The inclusion of
graduate students, non-traditional college students, and commuter students may have impacted results, particularly with respect to variables that are more salient for students living on or near campus. Specifically, satisfaction with college peers and institutional attachment are likely to impact traditional-college-aged undergraduates living on campus more strongly than non-traditional-aged undergraduates, graduate students and/or students living off campus. Prior research suggests that students who live off campus are more likely to drop out of college than students who live on campus, and some researchers have theorized that this is due to a stronger feeling of belonging and connection to the institution for those who live on campus (Wolfe, 1993). However, others have argued that it is meaningless to evaluate the impact of commuter status, or status as a “non-traditional student” without taking socioeconomic status into account as a confounding factor (Bozick, 2007). Indeed, research on differences in attrition between traditional and non-traditional college students found that age at matriculation did not predict whether a student dropped out, but that being an employed student was the largest predictor of dropping out during the first year of college (Gilardi & Guglielmetti, 2011). Regardless, it is possible that these particular results would differ in a sample made up exclusively of undergraduates living on campus.

Additional limitations of the current study include a lack of racial and gender diversity in the current sample of college students. While the sample was diverse in some ways (e.g., sexual orientation and year in school), it was overwhelmingly White (74%) and female (87%), even in comparison to the demographic profile of each campus (see Appendix A). Research consistently finds that women are more likely to seek help for mental illness, and are more open about experiencing mental health challenges, than men (Mackenzie, Gekoski, & Knox, 2006) and this pattern holds true in college students (Seamark & Gabriel, 2018). There are similarly consistent
findings with respect to the underutilization of mental health services by racial and ethnic minorities (Villatoro, Mays, Ponce, & Aneshensel, 2018), which may partly explain why this intervention appealed disproportionately to White, female students. This limits the ability to generalize these results to non-White and non-female college students. The lack of diversity in the sample is particularly important given the current study’s focus on stigma. It is well established that individuals with multiple stigmatized identities experience worse outcomes than those with a single stigmatized identity, and multiple stigmas have exponential additive effects on quality of life and mental health symptoms (Thompson, Noel, & Campbell, 2004). Students of color living with mental illness face unique challenges that were not addressed in the current study and are not adequately captured by the current sample.

The language used throughout this intervention could be interpreted as both a potential strength and a potential limitation. As noted above, HOP used to be called COP, or “Coming Out Proud.” Although the title of the intervention was changed to “Honest, Open, Proud” because the use of “Coming Out Proud” was misleading and arguably even offensive, the protocol itself still uses the phrase “coming out” to describe disclosure of a concealable stigma, in this case mental illness. The phrase “coming out,” as well “pride” or “proud,” represents language widely associated with the LGBTQ community. Thus, the use of this language to describe disclosure about one’s mental health status may have been off-putting for participants who identify as members of the LGBTQ community, as this could be interpreted as language appropriation. On the other hand, the intervention content may have resonated more strongly with those who have already had to “come out” about another concealable stigmatized aspect of their identity.

Notably, the original creators of COP/HOP grounded the intervention in literature taken largely from research with the LGBTQ community demonstrating the positive psychological effects of
disclosure and the negative psychological effects of secrecy (Corrigan et al., 2013). Corrigan and colleagues (2013), when first proposing the COP intervention (prior to any research trials), primarily cite literature from this population to support the intervention’s focus on disclosure. Future research could examine whether sexual orientation moderates response to HOP-C. Additionally, qualitative data could be collected from participants to assess how LGBTQ participants felt about the use of terms like “coming out” and “proud” in study materials. This information could then help shape the format and content of the HOP-C intervention moving forward.

In addition to sexual orientation, other moderators of treatment response should be examined in future analyses. For example, gender, age, and year in school could all play a role. A previous trial of HOP (Corrigan et al., 2015) found a significant effect on depression in females but not males, suggesting that gender should be examined as a moderator. Additionally, it is possible that students who have started college recently may have more room to grow in terms of relationships with college peers and with the institution. While the current study did not collect data on commuter status, this would also be an interesting moderator to explore. Living on campus would likely make institutional attachment more salient and relevant to well-being. Another potential moderator would be psychiatric diagnosis. Although, like the disclosure measure, questions about diagnosis were added too late to perform any meaningful analyses with this variable, scores on the CESD-10 and the GAD-7 can provide an indication of overall severity of depression and anxiety symptoms for participants in this sample. First, 79.6% of the sample (\(N = 86\)) had a CESD-10 score at T1 greater than the established cut-off of 10 indicating clinical risk for a depressive disorder (Andresen, Malmgren, Carter, & Patrick, 1994). Further, 63.0% of the sample (\(N = 68\)) had a GAD-7 score at T1 above the established cut-off indicating
clinical risk for an anxiety disorder (also 10; Spitzer et al., 2006). This suggests that depression and anxiety were common diagnoses in this sample, which is consistent with national survey data showing that depression and anxiety are the most common mental health concerns in college students (CCMH, 2017). A question for future research is whether the HOP-C intervention is particularly useful for college students living with a particular diagnosis or cluster of symptoms. Preliminary analyses do suggest that intervention effects on self-stigma are particularly strong for students with clinically at-risk depression scores, compared to the sample as a whole (Hundert, Conley, Charles, Qin, & Corrigan, 2019). These preliminary findings suggest that HOP-C may be especially indicated for college students with clinically elevated depression symptoms. Future analyses could examine the same question with anxiety symptoms, and future trials of HOP-C should collect information about participant diagnoses from the start in order to examine these questions more thoroughly.

As mentioned above, the trial of HOP with adolescents included at least moderate levels of disclosure-related distress as an inclusion criterion (Mulfinger et al., 2017). In fact, all previous trials of COP/HOP included this same criterion for inclusion (Corrigan et al., 2015; Rüsch et al., 2014). This major difference in recruitment method, and the subsequent difference in sample characteristics, limits the ability to compare the findings from this trial with findings from previous trials of the same intervention. Related to this issue, the disclosure measure was added too late in the current study to examine any actual changes in disclosure behavior from pre- to post-intervention. We can only examine disclosure attitudes reflected by disclosure-related self-efficacy. Unfortunately, a large body of social psychology research has concluded that attitudes are not a good proxy for behavior (Wegener & Wallace, 2018), so no conclusions can be made about intervention effects on actual disclosure behavior.
A possible future direction for HOP-C is moving the intervention to a mobile app-based format. College students experiencing high levels of self-stigma likely did not sign up to participate in the HOP-C study, as this would have involved “outing” themselves from the beginning. A mobile app would be more anonymous than an in-person group, and thus may reach a population with higher levels of self-stigma. Additionally, the current study struggled to maintain consistent attendance at sessions, due to both lack of adherence and scheduling around school breaks and holidays. An app-based format would avoid some of these concerns, but introduces many unique concerns such as confidentiality and safety. The researchers responsible for designing the HOP-C intervention are currently conceptualizing how this could be carried out safely and effectively. Research indicates that technology-based interventions can successfully reduce symptoms of depression and anxiety in college students (Conley, Durlak, Shapiro, Kirsch, & Zahniser, 2016). In their meta-analysis of tech-based mental health interventions for college students, Conley and colleagues (2016) note that almost all interventions examined were self-administered, making this type of approach scalable and easily implemented on college campuses.

Conclusions and Implications

The current study confirms the positive relationship between higher satisfaction with college peers and stronger institutional attachment (Cousins et al., 2017; Friedlander et al., 2007; Swenson, et al., 2008). This study also builds upon prior research examining the positive relationship between institutional attachment and well-being (Love et al., 2009) by demonstrating that stronger institutional attachment predicts lower levels of depression symptoms in college students. These findings have myriad clinical and policy implications for university personnel involved in promoting student mental health and well-being. First,
facilitating opportunities for students to foster close relationships with peers at their institution will improve those students’ institutional attachment and thus could improve well-being, reduce depression symptoms, and increase retention (Gerdes & Mallinckrodt, 1994; Krotseng, 1992; Mann, 2004). One way to facilitate such opportunities is university sponsorship of organized activities on campus, as research indicates that participating in organized activities in college (e.g., athletics, performing arts, student leadership, volunteer organizations) predicts stronger friendships with college peers (Bohnert, Aikins, & Edidin, 2007). Second, interventions that increase institutional attachment (e.g., pre-orientation programs; Bobilya et al. 2009) could prevent or reduce depression symptoms. However, interventions that just happen to occur on campus (like HOP-C), but do not directly target adaptation to college or institutional attachment, may not have enough of a salient institutional component to achieve this effect.

Overall, health promotion initiatives on college campuses can, and should, place a strong focus on building community and fostering a sense of belonging at the university. As these findings indicate, doing so will indirectly improve mental health outcomes while also improving student engagement and retention.
APPENDIX A

MULTI-SITE METHODS
<table>
<thead>
<tr>
<th>Campus 1</th>
<th>Campus 2</th>
<th>Campus 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demographic profile of the school</td>
<td>Private Jesuit affiliation</td>
<td>Private Technology-focused Catholic affiliation</td>
</tr>
<tr>
<td></td>
<td>Urban Midwestern setting</td>
<td>Urban Midwestern setting</td>
</tr>
<tr>
<td></td>
<td>Undergraduate enrollment: 11,420</td>
<td>Undergraduate enrollment: 2,924</td>
</tr>
<tr>
<td></td>
<td>Graduate/professional enrollment: 5,253</td>
<td>Graduate/professional enrollment: 4,342</td>
</tr>
<tr>
<td></td>
<td>66% female</td>
<td>31% female</td>
</tr>
<tr>
<td></td>
<td>61% White; 14% Hispanic/Latino; 12% Asian; 8% African-American; 6% international</td>
<td>34% White; 16% Hispanic/Latino; 13% Asian; 6% African-American; 46% international</td>
</tr>
<tr>
<td></td>
<td>60% live off-campus</td>
<td>61% live off-campus</td>
</tr>
<tr>
<td>Demographic profile of HOP-C sample included in the current study</td>
<td>Mean age = 19.00 (SD = 1.08) 88% female 77% White; 18% Hispanic/Latino; 12% Asian; 6% African-American 59% heterosexual</td>
<td>Mean age = 21.84 (SD = 2.09) 74% female 26% White; 21% Hispanic/Latino; 42% Asian; 16% African-American 68% heterosexual</td>
</tr>
<tr>
<td>Total enrolled participants</td>
<td>HOP-C = 39 Control = 34</td>
<td>HOP-C = 11 Control = 8</td>
</tr>
<tr>
<td>Type of control group</td>
<td>Survey-only (opportunity to participate in group as non-research participant in future semesters offered)</td>
<td>Waitlist</td>
</tr>
<tr>
<td>Recruitment of peer facilitators</td>
<td>Flyers; email to psychology internship course; for second year, email sent to previous study participants</td>
<td>Facilitator from NAMI was hired; email to previous participants</td>
</tr>
<tr>
<td></td>
<td>Done by graduate student</td>
<td>Done by faculty member</td>
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<td>--------------------------</td>
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</tr>
<tr>
<td>Interviewing and selection of peer facilitators</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Recruitment of participants</td>
<td>Flyers around campus; emails to relevant student groups; advertisement by various student services staff; research participant pool for psychology students</td>
<td>Flyers; recruitment on campus website; emails to individuals who expressed interest in the past but couldn’t participate</td>
</tr>
<tr>
<td>Inclusion criteria</td>
<td>Undergraduate student at Campus 1; age 18 or older; identifies as having a mental illness</td>
<td>Student at Campus 2; age 18 or older; self-reported having mental health challenges</td>
</tr>
<tr>
<td>Exclusion criteria</td>
<td>Having substance abuse as the only mental health concern</td>
<td>None (unknown if any participants had solely substance abuse concerns)</td>
</tr>
<tr>
<td>Screen for inclusion/exclusion criteria</td>
<td>Phone screen 2016-2017; brief online survey 2017-2018</td>
<td>Phone screen</td>
</tr>
<tr>
<td>Consent</td>
<td>In-person session led by graduate student</td>
<td>Online consent</td>
</tr>
<tr>
<td>Randomization Method</td>
<td>Pieces of paper with “HOP” or “Questionnaire Only” written on them, shuffled and handed out blindly at consent session</td>
<td>2016-2017: used online random number generator; 2018: cards with “HOP” or “Control” written on them after screening</td>
</tr>
<tr>
<td>Number of sessions</td>
<td>3 + booster = 4</td>
<td>3 + booster = 4</td>
</tr>
<tr>
<td><strong>Timing of booster session</strong></td>
<td>3 weeks after last (3rd) session</td>
<td>3 weeks after last (3rd) session</td>
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<td>-------------------------------</td>
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<tr>
<td><strong>Length of sessions</strong></td>
<td>Scheduled in two-hour blocks; actual sessions varied ~1.5-2 hours</td>
<td>Scheduled in two-hour blocks; actual sessions varied ~1.5-2 hours</td>
</tr>
<tr>
<td><strong>When surveys occurred</strong></td>
<td>Pre Post Session 3 Post-booster 1-month follow-up</td>
<td>Pre Post Session 3 Post-booster</td>
</tr>
<tr>
<td><strong>When pre survey link was emailed to participants, relative to first session</strong></td>
<td>Within the week before; usually at end of consent session, which was within one week before first session</td>
<td>Participants came in to fill out the surveys 30 minutes prior the first session, or participants received surveys 2 days prior the first session</td>
</tr>
<tr>
<td><strong>When post survey link was emailed, relative to last session</strong></td>
<td>Immediately after, or within 3 days</td>
<td>Immediately after</td>
</tr>
<tr>
<td><strong>When 3rd survey link was emailed, relative to booster session</strong></td>
<td>Immediately after, or within 3 days</td>
<td>Immediately after</td>
</tr>
<tr>
<td><strong>How much time students were given to complete surveys (range)</strong></td>
<td>2-4 days (varied based on weekends, holidays, etc.)</td>
<td>2-4 days</td>
</tr>
<tr>
<td><strong>Compensation</strong></td>
<td>$10 gift card or 2 research credits per survey completed</td>
<td>$10 gift card per survey completed</td>
</tr>
</tbody>
</table>
APPENDIX B

MEASURES
Below is a list of some of the ways you may have felt or behaved. Please indicate how often you have felt this way during the past week by checking the appropriate box for each question.

<table>
<thead>
<tr>
<th>Items:</th>
<th>Rarely or none of the time (less than 1 day)</th>
<th>Some or a little of the time (1-2 days)</th>
<th>Occasionally or a moderate amount of time (3-4 days)</th>
<th>All of the time (5-7 days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that usually don't bother me.</td>
<td></td>
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<td></td>
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<tr>
<td>2. I had trouble keeping my mind on what I was doing</td>
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<tr>
<td>3. I felt depressed.</td>
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<tr>
<td>4. I felt that everything I did was an effort.</td>
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<tr>
<td>5. I felt hopeful about the future.</td>
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<tr>
<td>6. I felt fearful.</td>
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<tr>
<td>7. My sleep was restless.</td>
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<td></td>
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<tr>
<td>8. I was happy.</td>
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<tr>
<td>9. I felt lonely.</td>
<td></td>
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</tr>
<tr>
<td>10. I could not &quot;get going.&quot;</td>
<td></td>
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</tr>
</tbody>
</table>
Over the last 2 weeks, how often have you been bothered by the following problems?

0 Not at all

1 Several days

2 Over half the days

3 Nearly every day/

1. Feeling nervous, anxious, or on edge

2. Not being able to stop or control worrying

3. Worrying too much about different things

4. Trouble relaxing

5. Being so restless that it's hard to sit still

6. Becoming easily annoyed or irritable

7. Feeling afraid as if something awful might happen
### Relationship Satisfaction and Availability Scale

How satisfied are you, overall, with the following relationships?

<table>
<thead>
<tr>
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</table>

not at all  

---

very much

- **Friends at [College Name]**
- Friends from home / before college
- Romantic partner
- Mother
- Father

To what degree can you contact or otherwise interact with the following people when in need?

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not at all  

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very much

- **Friends at [College Name]**
- Friends from home / before college
- Romantic partner
- Mother
- Father
Student Adaptation to College Questionnaire (SACQ) - Institutional Attachment Subscale

These statements describe people's college experiences. Read each one and decide how well it applies to you at the present time (within the past few days). For each statement, choose the number along the continuum that best represents how closely the statement applies to you.

1. I feel that I fit in well as part of the college environment.
2. I am meeting as many people and making as many friends as I would like at college.
3. I am pleased now about my decision to go to college.
4. I am pleased now about my decision to attend this college in particular.
5. I enjoy living in a college dormitory. (Any university housing should be regarded as a dormitory. Please LEAVE BLANK if you do not live in a dormitory.)
6. I wish I were at another college or university.
7. I am satisfied with the number and variety of courses available at college.
8. I'm having difficulty feeling at ease with other people at college.
9. I expect to stay at this college for a bachelor's degree.
10. I feel I am very different from other students at college in ways I don't like.
11. On balance, I would rather be at home than here.
12. Lately I have been giving a lot of thought to transferring to another college.
13. Lately I have been giving a lot of thought to dropping out of college altogether and for good.
14. I find myself giving considerable thought to taking time off from college and finishing later.
15. I am quite satisfied with my social life at college.
REFERENCE LIST


VITA

Carol Hundert was born in Boston, MA and raised in Shaker Heights, OH. Before attending Loyola University Chicago, she attended Yale University in New Haven, CT, where she earned a Bachelor of Science in Psychology, graduating in 2014. After graduation, Carol worked for two years as a research assistant at the Boston VA Healthcare System in Boston, MA, assisting with research on post-traumatic stress and moral injury in veterans and service members.

While at Loyola University Chicago, Carol has worked as a research assistant in the lab of Dr. Colleen Conley, focusing on emerging adulthood and college student mental health. She has also served as Internship Coordinator for the undergraduate course “Internship in Psychology” and as teaching assistant for several professors within the psychology department. This year, Carol is an extern at the University of Chicago Medicine, where she conducts neuropsychological assessments with children and adolescents.