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Exploring individual and dyadic associations of dispositional mindfulness as an ameliorative factor of anxiety and roommate satisfaction among undergraduate roommates.

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<https://doi.org/10.18297/etd/3287>

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EXPLORING INDIVIDUAL AND DYADIC ASSOCIATIONS OF DISPOSITIONAL
MINDFULNESS AS AN AMELIORATIVE FACTOR OF ANXIETY AND
ROOMMATE SATISFACTION AMONG UNDERGRADUATE ROOMMATES

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M.S., University of Louisville, 2016

A Dissertation
Submitted to the Faculty of the
College of Arts and Sciences of the University of Louisville
in Partial Fulfillment of the Requirements
for the Degree of

Doctor of Philosophy in Clinical Psychology

Department of Psychological and Brain Sciences
University of Louisville
Louisville, Kentucky

August 2019

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DEDICATION

This dissertation is dedicated to my Grandma and Grandpa Snay and my Grandma and Grandpa Phillips. Without these four loving and faith-filled individuals, I would not have been blessed with such an encouraging and supportive family. Throughout my graduate career I have felt assured by their presence as guardians, which has helped me persevere and reach new heights as a scientist, clinician, professional, and as a person.

ACKNOWLEDGEMENTS

I would like to acknowledge my mentor, Dr. Sandra Sephton, for whom I am eternally grateful. This dissertation would not have been possible without her encouragement, support, and belief in me to push boundaries and follow my passion. It has been the greatest pleasure to have such a great model of a strong, female scientist. I would also like to thank Dr. Paul Salmon for helping foster my personal journey with mindfulness meditation and for his endless support in my endeavors as a clinician and scientist. I feel extremely lucky to have been a part of the Mindfulness and Biobehavioral Health Research Lab under the collaborative direction of Drs. Sephton and Salmon, and I would like to extend my appreciation for my fellow labmates, including Chelsea Siwik for her friendship, wisdom, and unwavering support, Allie Hicks for being my partner in crime with the onerous study that supported this dissertation, and Dr. Whitney Rebholz for her peer mentorship throughout my graduate career. I am also extremely grateful for the support and guidance that I have received from Dr. Elizabeth Cash, as she is the true embodiment of the scientist-practitioner that I strive to be.

I would like to acknowledge and thank the other members of my dissertation committee, Drs. Marci DeCaro and Amanda Mitchell. The incredible generosity, support, and wisdom that they have provided throughout the course of this study has undoubtedly contributed to the success of this dissertation.

I would like to thank my family, especially my parents, Tom and Jane Phillips, and my sister, Mallory Prince, for always believing in me and standing by me every step

of the way. I would not be where I am today without their unwavering love, support, and encouragement to chase my dreams. I am also eternally grateful for all of my aunts, uncles, cousins, and friends who have supported me throughout this journey.

Funding for this study was provided by a Research – Type II Grant, #140436 (PI: Sandra E. Sephton, Ph.D.) from the University of Louisville Office of the Executive Vice President for Research and Innovation.

ABSTRACT

EXPLORING INDIVIDUAL AND DYADIC ASSOCIATIONS OF DISPOSITIONAL MINDFULNESS AS AN AMELIORATIVE FACTOR OF ANXIETY AND ROOMMATE SATISFACTION AMONG UNDERGRADUATE ROOMMATES

Kala Phillips, M.S.

June 15, 2018

For many young adults, the college experience is stressful and the transition and adjustment to college life can present many unique challenges. These stressful adjustments in academic and financial realms have been associated with psychological distress, including rates of anxiety, which appear to be rising among undergraduates. Social transitions, including the experience of living with a roommate, can also present challenges for college students as they must navigate new relationships. The current study explored dispositional mindfulness, a capacity for attending to present-moment experiences, as a potential ameliorative factor of anxiety and roommate satisfaction. It was hypothesized that greater dispositional mindfulness would be associated with lower anxiety and three facets of roommate relationship satisfaction (trust, communication, and alienation). Dyadic associations of dispositional mindfulness were also explored; it was hypothesized that an individual's level of dispositional mindfulness would be associated with his/her roommate's level of anxiety and roommate satisfaction.

Fifty undergraduate roommate dyads (N=100) provided self-report measures of demographics, dispositional mindfulness, anxiety, and roommate satisfaction. Simple regression analyses tested hypothesized relationships. Multiple hierarchical regression

analyses adjusted for theoretical and empirically-derived controls in tests of hypothesized relationships.

Results revealed that dispositional mindfulness was negatively associated with anxiety, a finding that persisted after adjustment of control variables. Dispositional mindfulness was positively associated with perceived quality of communication with roommate, a finding that did not persist after adjustment of control variables. Exploratory secondary analyses revealed academic factors were associated with anxiety, and demographic and roommate-specific factors were associated with roommate relationship satisfaction.

Findings provide strong support for mindfulness as a possible ameliorative factor of college anxiety. The current study also provides preliminary evidence for the association of mindfulness with regard to the quality of communication between members of a dyad. This novel finding among undergraduate roommates, and the broader context of non-romantic dyads, highlights the importance of exploring the possible benefits of mindfulness in the context of relationships. Implementation of mindfulness-based interventions on college campuses may help mitigate the negative effects of the college transition on anxiety and roommate satisfaction toward optimal academic and psychosocial functioning.

TABLE OF CONTENTS

	PAGE
DEDICATION	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	vi
LIST OF TABLES	xi
LIST OF FIGURES	xiii
INTRODUCTION	1
College students: The role of Stress, Anxiety, and Social Adjustment	1
Social Context of College and Importance of Roommate Satisfaction	7
Mindfulness as an Ameliorative Factor.....	11
Associations of Mindfulness and Anxiety.....	13
Associations of Mindfulness and Relationship Satisfaction	16
Applying Associations of Mindfulness and Relationship Satisfaction to College Roommates	19
Mutual trust.....	20
Quality of communication.	21
Extent of alienation.....	21
Dyadic Effects of Dispositional Mindfulness on Anxiety and Relationship Satisfaction Among College Roommates	23

Summary / Review of Limitations in the Current Literature	27
Study Aims	29
Hypotheses	30
Analytic Strategy	30
METHODS	33
Recruitment	33
Participants	34
Procedure	36
Measures	37
Demographic Questionnaire	37
Mindful Attention Awareness Scale (MAAS), trait version.	38
Generalized Anxiety Disorder 7-item (GAD-7)	39
Inventory of Parent and Peer Attachment (IPPA), peer subscale.	39
Statistical Analyses	40
Data preprocessing.	40
Testing assumptions of dyadic data analysis.	41
Primary analysis.	41
Secondary analysis.	42
Sample size and statistical power for regression analyses.	48
RESULTS	49
Data Preprocessing	49
Testing Assumptions of Dyadic Data Analysis	51

Primary Analysis	52
Preliminary analyses for primary analysis.....	52
Simple regression analyses for primary analysis.	53
Secondary Analysis	54
Preliminary analyses of potential control variables for secondary analysis.	54
Selection of control variables for secondary analysis.	55
Hierarchical multiple regression analyses for secondary analysis.	57
DISCUSSION	62
Overview of Significant Findings in Hypothesized Associations	62
Main Findings.....	68
Testing assumptions of dyadic data analysis.	68
Primary analyses.....	69
Secondary analyses.....	73
Strengths and Limitations.....	80
Implications / Future Directions	82
Conclusions	85
REFERENCES	86
APPENDIX A.....	125
CURRICULUM VITAE	128

LIST OF TABLES

TABLE	PAGE
1. Roommate dyads enrolled in, and consented to each of the nine participation groups.....	108
2. Summary of theoretical and potential empirically-derived control variables assessed for inclusion in secondary analyses	109
3. Sample characteristics.....	110
4. Sample descriptives on independent and dependent variables of interest	111
5. Summary of regression analyses assessing actor dispositional mindfulness as a predictor of outcomes, outlined by hypothesis number	112
6. Summary of theoretical and empirically-derived control variables adjusted in secondary analyses of hypothesized associations	113
7. Correlation matrix of control variables, predictor variable (mindfulness), and outcome variables; created for the purpose of assessing multicollinearity and selecting empirically-derived control variables	114
8. Summary of hierarchical regression analyses assessing theoretical control variables and actor dispositional mindfulness as predictors of actor anxiety	115
9. Summary of hierarchical regression analyses assessing theoretical and empirical control variables and actor dispositional mindfulness as predictors of actor perceived trust in roommate	116

10. Summary of hierarchical regression analyses assessing theoretical control variables and actor dispositional mindfulness as predictors of actor perceived quality of communication with roommate	117
11. Summary of hierarchical regression analyses assessing theoretical and empirical control variables and actor dispositional mindfulness as predictors of actor perceived extent of alienation by roommate	118
12. Summary of hierarchical regression analyses assessing theoretical control variables and actor dispositional mindfulness as predictors of partner anxiety ..	119
13. Summary of hierarchical regression analyses assessing theoretical control variables and actor dispositional mindfulness as predictors of partner perceived trust in roommate	120
14. Summary of hierarchical regression analyses assessing theoretical control variables and actor dispositional mindfulness as predictors of partner perceived quality of communication with roommate	121
15. Summary of hierarchical regression analyses assessing theoretical control variables and actor dispositional mindfulness as predictors of partner perceived extent of alienation by roommate	122
16. Summary of significant associations in simple regression analyses assessing actor dispositional mindfulness as a predictor of actor and partner outcome variables	123
17. Summary of significant individual predictors in hierarchical regression analyses of hypothesized associations, adjusted for control variables	124

LIST OF FIGURES

FIGURE		PAGE
1.	A published model displaying the ameliorative and stress-reducing aspects of mindfulness and MBSR on stress-health pathways	102
2.	The actor-partner interdependence model (APIM).....	103
3.	A visual display of hypotheses represented by four APIM models	104
4.	A visual display of the stepwise projected enrollment strategy and research activity schedule of the parent study	106
5.	A flow chart of participant enrollment.....	107

INTRODUCTION

College students: The role of Stress, Anxiety, and Social Adjustment

Although the experience of some stress during college years is normal, the prevalence rates of severe emotional distress among college undergraduates is rising (Beiter et al., 2015). According to the National College Health Assessment (2013), approximately one-third of college students reported symptoms of depression and close to one-half of students were identified as experiencing symptoms of anxiety. Of the student populations surveyed (N=125,000), 48.7% of students sought mental health services at a university counseling center. More recent estimates from national survey data suggest that approximately 17% of college students were diagnosed with, or treated for anxiety over the course of the prior year (American College Health Association, 2016). Additionally, generalized anxiety was the mental health disorder with the largest significant increase in rates over the course of 2010 to 2015 among students who had completed an intake assessment (N=476,388) at 161 college counseling centers across the United States (Xiao et al., 2017). A separate national survey of 279 college counseling center directors supported this trend of rising rates of psychological concerns, such that 89% of directors reported increases in anxiety among students on their college campuses (Gallagher, 2015). Understanding these rising rates of anxiety and other mental health concerns among undergraduates is critical, given the implications that these concerns have on academic achievement, drop-out, and poor adjustment to college.

Seminal research has demonstrated direct effects of anxiety on academic achievement, including performance on the SAT, course grades, and overall GPA (Alpert & Haber, 1960). Specifically, this work revealed that for persons with higher levels of anxiety, anxiety in academic settings can be debilitating, and was associated with poorer course grades and lower cumulative GPA. The significant association between higher anxiety and lower GPA has been further supported by meta-analytic studies among elementary and secondary students (Hembree, 1988), as well as among undergraduate and graduate students (Chapell et al., 2005). More recent research has supported these findings, with higher levels of anxiety associated with lower GPA, and lower GPA among undergraduates associated with greater retention (DeBerard, Spielmans, & Julka, 2004). Moreover, experiences of stress and anxiety in college have been associated with poor coping strategies, including the use of substances (Pullen, 1994). Substance use among adolescents has been associated with similar decreases in academic achievement (Jeynes, 2002), with substance use in college associated with behaviors detrimental to academic success, including skipping class, lower grades, and college drop-out (Arria, Caldeira, Bugbee, Vincent, & O'Grady, 2013; Martinez, Sher, Krull, & Wood, 2009). Collectively, these works have demonstrated the potential negative consequences of anxiety on academic outcomes, including lower GPA and substance use, which in turn have been associated with behaviors deleterious to college success, including rates of greater retention.

Additional research suggests that first-year college students with existing anxiety symptoms may experience increase symptoms in response to the extent of stress experienced, and that levels of stress may ignite symptoms of anxiety in previously

symptom-free students (Ștefan, Căpraru, & Szilágyi, 2018). A longitudinal study among first year college students revealed highest levels of stress at the beginning of the semester, with decreases in stress associated with improvements in academic, emotional, and social adjustment (Friedlander, Reid, Shupak, & Cribbie, 2007). Cross-sectional research has further supported the association between level of stress during the first year of college with personal-emotional adjustment (Clinciu, 2013), including the specific association between academic stress and anxiety (Misra & McKean, 2000). Importantly, each of these studies revealed experiences of heightened stress among first-year college students (Clinciu, 2013; Friedlander et al., 2007; Ștefan et al., 2018), which may be reflective of the college transition, as further research has revealed first- and second-year students experienced greater reactions to stress compared to third- and fourth-year students (Misra & McKean, 2000). Therefore, the stress that students experience throughout the semester may be one factor that contributes to the level of undergraduate anxiety at a given time, and the investigation of these associations may be particularly relevant among first-year students.

Increased levels of psychological distress, including levels of anxiety appear to result from a variety of stressors, beyond that of the “typical” stress associated with a collegiate academic workload. In a study of 374 students, stress, depression, and anxiety were associated with academic stressors, pressure to succeed, post-graduation plans, and finances (Beiter et al., 2015). Similar findings were shown in a study of 351 undergraduates, wherein levels of clinical anxiety increased to 9% and clinical depression to 20% in previously symptom-free students by mid-course. The presentation of these symptoms was predicted by relationship and financial stressors, respectively (Andrews &

Wilding, 2004). A common theme among these studies is that college students with financial difficulties are more likely to endorse symptoms of anxiety and depression (Andrews & Wilding, 2004; Beiter et al., 2015; Eisenberg, Gollust, Golberstein, & Hefner, 2007). Many students experience anxiety and worry centered on the cost of college tuition, often contributing to college students seeking employment. Paradoxically, students seek employment to pay for college courses, yet the number of hours worked per week has been negatively associated with GPA among first year college students (Trockel, Barnes, & Egget, 2000). Additionally, students working greater than 20 hours weekly have been shown to be more likely to drop out of college compared to students working less than 20 hours weekly (Bozick, 2007). Though seeking employment may relieve anxiety centered on financial concerns, recent research revealed that college students who were employed demonstrated greater anxiety than those who were not employed (Mounsey, Vandehey, & Diekhoff, 2013). It is clear that financial concerns and student employment may be a factor associated with rates of anxiety in undergraduates, including the role that employment may play on GPA and student retention.

Anxiety in college has also been associated with a number of demographic factors, including biological sex and stressors related to race. Within the academic setting, sex differences in levels of anxiety have been consistently demonstrated, such that females tend to report higher levels of anxiety than males (Head & Lindsey, 1983; Hembree, 1988). These sex differences have been replicated among both undergraduate (Misra & McKean, 2000) and graduate students (Chapell et al., 2005). Further, undergraduate and graduate females with higher anxiety earned a lower GPA than college

females with lower levels of anxiety; a finding not demonstrated for males in this sample (Chapell et al., 2005).

Additionally, a vast literature has revealed racial differences in levels of anxiety and academic achievement on college campuses. The historical segregation of Black and White students on college campuses, followed by the ‘integration’ of Black students on White college campuses have contributed to experiences of stress, anxiety, and fears of rejection for Black and minority students on today’s college campuses (Allen, 1992; Allen, 1988; Mendoza-Denton, Downey, Purdie, Davis, & Pietrzak, 2002; Smedley, Myers, & Harrell, 1993). Given this historical context, many African American students have reported anxiety centered on fears of rejection by peers, faculty, and the institution at large. A longitudinal study assessing the impact of this anxiety for African American students revealed that race-related anxiety predicted lower levels of perceived trust in the institution, feelings of isolation, and poorer academic outcomes, such as GPA, over the course of two to three years (Mendoza-Denton et al., 2002). Other students of racial minority status, such as Hispanic or Asian American college students have demonstrated greater distress compared to European American students, with greater levels stress reported by female Hispanic students (Holliday et al., 2016) and greater risk of distress for female Asian Americans (Masuda, Wendell, Chou, & Feinstein, 2010). Female minority students are proposed to exhibit greater levels of distress compared to minority males due to status as a double minority. It is also proposed that Asian American students experience greater distress due to the stigma of Asian American college students as “Model Minorities,” which places increased pressure on these students to meet high standards. Additionally, common cultural practices among Asian Americans, such as

self-concealment, which promotes keeping emotional distress from others, has been positively associated with levels of anxiety (Kahn & Hessling, 2001).

Overall, though experiences may be different for racial minority groups, evidence suggests that racial minority status, as well as double-minority status of female minority students, may be factors contributing to experiences of anxiety within the academic setting. Importantly, the first year of a minority student's college education and the corresponding adjustment to college life has been reported as a strong predictor of subsequent academic achievement (Hurtado, Carter, & Spuler, 1996; Locks, Hurtado, Bowman, & Oseguera, 2008), such that racial minority students have consistently higher rates of dropout, lower rates of graduation, lower rates of matriculation into graduate programs, and consistently lower GPA's compared to White students (Allen, 1988; Smedley et al., 1993).

In summary, there appears to be a great need to increase understanding and attention placed on the experiences of psychological distress among college students, particularly the rates of anxiety, which appear to be rising across the nation. Levels of anxiety among college students have been associated with a variety of stressors, including academic stress and overall stress level of the semester, academic year, financial stressors and employment status, and demographic factors, such as biological sex and race. Importantly, increasing our understanding of these associations is critical given the impact of anxiety on factors associated with academic achievement, including GPA, retention rates, and overall healthy adjustment to college life.

Social Context of College and Importance of Roommate Satisfaction

The social context of college presents unique challenges as students transition to college life. College students are often separated from the consistent contact with their customary support system, including high school friends and family members (Hudd et al., 2000), thereby reducing their consoling capabilities. Additionally, while a new system of support is being established, stress levels continue to rise; social outings and social activities that might traditionally decrease stress levels in young adults can increase stress levels during this transition state (Hudd et al., 2000). For some students, these changes in social context, including the need to establish new relationships, may lead to symptoms of anxiety (Andrews & Wilding, 2004). This rise in stress and anxiety at the time of social transition may be informed by Bowlby's theory of attachment (Bowlby, 1969, 1973). From the perspective of Bowlby's theory of attachment, individuals are "pre-programmed" to form attachments with other individuals for survival. Therefore, when removed from the parents and peers with whom an individual has previously attached, it is likely that an individual will experience an increase in stress (Bowlby, 1973), as the individual has experienced loss of proximal closeness and is faced with fear and anxiety centered on the need to replace these attachments to survive in new surroundings.

Given this survival need, college roommates present a unique opportunity for attachment and transition in social roles and relationships, as college roommates have frequent contact, shared responsibilities, and are often the first non-family member with whom one lives. In a review of college roommate relationships, positive roommate relationships were conceptualized as central to the social functioning of students (Erb, Renshaw, Short, & Pollard, 2014). However, despite roommate matching systems used

by many universities to pair roommates according to various similarities (Lebedev et al., 2007), numerous college students do not form an ideal bond or attachment with their roommate. Roommate conflict and difficulties have been reported to hinder academic performance (American College Health Association, 2012). For example, widely-cited research by Sacerdote (2001) revealed that the effects of a college roommate are significantly related to freshman year GPA, and these significant associations remained after controlling for various living situation variables, such as noise or lighting within dorm rooms. Moreover, seminal research on student retention revealed that a student's satisfaction with the living environment plays an important role in student retention (Aitken, 1982; Spady, 1970; Tinto, 1975). Therefore, the development and maintenance of positive roommate relationships appears to be an essential component to the overall social and academic functioning of college undergraduates.

Additionally, various factors likely contribute to the level of roommate satisfaction among undergraduate roommates. For example, there is a vast literature demonstrating sex differences in social relationship factors (Eagly, 2013), such that females tend to place greater importance in, and reap greater benefit from social relationships compared to males. These sex differences were demonstrated in seminal research among college students, such that peer-group interactions were found to be more important for female compared to male students, with the quality of these interactions associated with retention rates for only female students (Pascarella & Terenzini, 1980).

Levels of roommate relationship satisfaction may also be associated with race, as social adjustment and psychosocial difficulties are reported to predict college adjustment for racial minority students (Allen, 1992; Hurtado et al., 1996). Research among

interracial roommate dyads revealed that White students living with an African American student reported lower roommate relationship satisfaction, including lower ratings of social involvement and time spent with roommate compared to White students living with another White student (Shook & Fazio, 2008). Similarly, a separate investigation revealed that interracial roommate dyads reported lower daily positive emotions, lower intimacy toward roommate, a lower desire to live with roommate, and fewer perceived intimacy-building behaviors compared to same-race roommate dyads, regardless of minority status (Trail, Shelton, & West, 2009). Moreover, the literature reviewed above revealed that African American students on predominantly White campuses often experienced race-related anxiety, which predicted lower levels of perceived trust in the institution, feelings of isolation, and poorer academic outcomes (Mendoza-Denton et al., 2002). Therefore, it is possible that racial differences between roommates may contribute to race-related anxiety and associated feelings of isolation. It is also possible that racial and cultural differences between roommates may limit the amount of information shared between roommates, ultimately affecting the roommate relationship. For example, self-concealment behavior in Asian American college students was associated with the perceived severity of interpersonal problems, including roommate problems (Liao, Rounds, & Klein, 2005).

The impact of poor roommate relationships have been associated with psychosocial factors, including loneliness, isolation, and lack of social support (Brissette, Scheier, & Carver, 2002; Cacioppo & Hawkley, 2009). Roommate relationships have also been reported as a factor contributing to levels of college stress (Dusselier, Dunn, Wang, Shelley, & Whalen, 2005). However, there is a dearth in the literature with regard

to investigations of the inverse associations, including psychosocial factors or levels of stress predicting roommate relationship satisfaction. For example, research has demonstrated that individuals who are socially anxious tend to experience fear in both positive and negative social encounters, which can hinder the establishment of social relationships in college, including that among college roommates (Valentiner, Skowronski, Mounts, & Holzman, 2017). However, research among roommates have not specifically examined the importance of anxiety levels on roommate satisfaction and attachment. Additionally, the literature reviewed above revealed academic stress, including stress of the semester (Friedlander et al., 2007; Ştefan et al., 2018), and financial stress (Andrews & Wilding, 2004; Beiter et al., 2015; Eisenberg et al., 2007) as common stressors among undergraduates. It is possible that the extent to which individuals engage in behaviors associated with relieving academic and financial stress may disrupt the development of meaningful relationships with roommates. For example, depending on the level of academic stress of the semester students may feel pressure to spend additional time studying as opposed to spending time with roommates, or one roommate's decision to obtain employment due to financial stress may impact roommate relationships, as work schedules may interfere with time spent with roommates. However, these associations of anxiety, semester stress, and employment on relationship satisfaction have yet to be fully explored among college roommate relationships.

In summary, it is clear that there is a need to identify factors that have the potential to mitigate negative adjustment to college, including factors that may facilitate positive roommate relationships for college students. Roommate satisfaction may be particularly important among first-year college students, as these individuals are faced

with the most prevalent adjustments to college life. The reviewed literature also suggests that demographic factors, such as biological sex and race are important considerations in understanding the relationship satisfaction among roommates. Further, hypothesized associations of psychosocial variables, including anxiety, stress of the semester, and employment status with roommate relationships were drawn, though a paucity of research has explored these associations. Overall, there is a need for greater attention placed on factors that may foster increased roommate satisfaction, as cultivating roommate satisfaction appears important not only for optimizing the social transition to college life, but in achieving desired academic outcomes among college students.

Mindfulness as an Ameliorative Factor

Mindfulness has been operationally defined as “awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment by moment” (Kabat-Zinn, 1993). Mindfulness has origins in Eastern philosophy and Buddhist traditions (Williams & Kabat-Zinn, 2011). According to these long-standing contemplative practices, mindfulness emerges through meditation practice, a process by which individuals set an intention for attending to the rich experiences of the present moment. More recently, a surge of mindfulness within Western culture has emerged as an integration of Eastern meditation practice with Western science. This movement has contributed to the development of mindfulness-based interventions (MBIs), including mindfulness-based stress reduction (MBSR), which was designed as an application for managing stress (Kabat-Zinn, 1990).

Our lab’s published model of the stress-reducing aspects of MBSR (Salmon, Sephton, & Dreeben, 2011), adapted from the Transactional Model of Stress and Coping

(Lazarus & Folkman, 1984), suggests that mindfulness has the potential to influence stress-health pathways by ameliorating coping patterns and stress reactivity following a stressor (Figure 1). This model can be used broadly as a conceptual framework in understanding the potential ameliorative influence of mindfulness on the stress-health pathways associated with the stressor of adjustment to college. Of the stress-health pathways illustrated in this model, emotional outcome and coping are two specific domains of particular relevance in adjustment to college. Specifically, heightened rates of distress, such as increased anxiety, can be characterized as an emotional outcome stemming from the stress of adjustment to college. Transitions in social roles, including the development of roommate relationships, can be characterized as social support and a facet of coping (Cohen & Wills, 1985) within the larger picture of college stress and adjustment to college life. When viewed in this way, mindfulness is illustrated as an ameliorative factor with the potential to impact both levels of anxiety and roommate relationships among college undergraduates.

Though this model of mindfulness as an ameliorative factor was constructed based on the literature demonstrating the various beneficial outcomes of MBSR, recent research suggests that mindfulness may also exist as a dispositional characteristic (Baer, 2011). Dispositional mindfulness highlights the inherent level of present-moment awareness that has been shown to vary from person to person. One large benefit of research studies that have examined dispositional mindfulness is that they do not require the time-intensive nature of MBIs in identifying potential benefits or associated outcomes of such practices. Rather, these studies can examine mindfulness associations with a self-reported measure of mindfulness. Therefore, there is potential utility in assessing

dispositional mindfulness as an ameliorative factor of anxiety and roommate relationships among college undergraduates.

The existing literature demonstrating the associations between mindfulness and anxiety, as well as mindfulness and relationship satisfaction is reviewed below. This literature review presents findings from both MBIs and studies assessing associations of dispositional mindfulness, as the literature base of dispositional mindfulness is still emerging and limited in size.

Associations of Mindfulness and Anxiety

A comprehensive review of various MBIs (Creswell, 2017) revealed that mindfulness interventions have overwhelmingly reduced symptoms of anxiety and depression. A meta-analysis examining 29 studies that employed MBSR among healthy adults revealed improvements in perceived stress, emotional distress, and quality of life following the eight-week program (Khoury, Sharma, Rush, & Fournier, 2015). These findings were further supported by a separate meta-analysis among healthy adults, which demonstrated MBSR significantly reduced stress, ruminative thinking and trait anxiety, as well as improved empathy and self-compassion (Chiesa & Serretti, 2009).

Young adults in particular have demonstrated benefits of mindfulness interventions, including decreases in stress (Oman, Shapiro, Thoresen, Plante, & Flinders, 2008), increases in psychological health (Bergen-Cico, Possemato, & Cheon, 2013), and improved academic stress and performance (Napora, 2013). A narrative review of 57 articles assessed the effects of MBSR and mindfulness meditation on stress and anxiety among college students (Bamber & Schneider, 2016). Findings from this review revealed that among the studies that measured anxiety, 100% of MBSR studies and 77% of

mindfulness meditation studies led to decreases in anxiety. Further, recent research among first year college students at risk for social anxiety demonstrated that MBSR significantly reduced levels of stress and social anxiety compared to controls (Ştefan et al., 2018). Importantly, a recent meta-analysis has suggested that mindfulness-based stress management programs offered through university health services are well-received by students (Regehr, Glancy, & Pitts, 2013).

This body of literature points to the substantial evidence demonstrating the ameliorative impact of MBIs on a host of factors, including a decrease in levels of anxiety. Importantly, these benefits have been demonstrated among college students – a population with high need and high reception of these practices. However, MBIs among college students have been generally criticized for having a small sample size with limited power, as well as a lack of active control groups and lack of randomization in some studies. MBI studies among college students are also criticized for the demographics of student samples, which have largely consisted of White female students who were self-selected for participation. Therefore, the effect size and generalizability of findings from MBIs among student samples are limited.

The empirical literature investigating dispositional mindfulness and psychological factors, such as anxiety, is flourishing. Current findings from these studies suggest dispositional mindfulness may present a beneficial effect on various outcomes, similar to the benefits of MBIs. Recent data from our laboratory show that among undergraduate students, greater dispositional mindfulness is associated with lower perceived stress and greater well-being (Zimmaro et al., 2016). Additional studies have shown that undergraduates with greater dispositional mindfulness demonstrate fewer symptoms of

anxiety and depression (Brown & Ryan, 2003; Masuda & Tully, 2012), improved quality of sleep, and better physical health (Murphy, Mermelstein, Edwards, & Gidycz, 2012).

However, given the emerging, yet sparse research on mindfulness as a dispositional characteristic, gaps in the literature exist that warrant further investigation. For example, though several studies have explored the association between dispositional mindfulness and general levels of psychological distress, only two known studies have demonstrated the specific relationship between dispositional mindfulness and anxiety in a college student sample (Brown & Ryan, 2003; Masuda & Tully, 2012). Therefore, further research is warranted to increase our understanding of this relationship. Replication of existing findings that have demonstrated associations between dispositional mindfulness and anxiety in a college student sample may provide evidence in support of implementing mindfulness-based interventions on college campuses. The implementation of such interventions appears timely and important, especially given the rising rates of anxiety among college undergraduates and the potential for anxiety to impact academic performance (Alpert & Haber, 1960; Chapell et al., 2005; DeBerard et al., 2004; Hembree, 1988).

Overall, existing longitudinal intervention studies among college students have revealed the ameliorative benefits of MBI, including improvements in stress, anxiety, and other facets of well-being. There is also growing evidence of cross-sectional studies among college students that have demonstrated the association between dispositional mindfulness and stress, anxiety, and health-related variables. Although the associations in cross-sectional studies cannot determine causal pathways of mindfulness, the associations with mindfulness in cross-sectional investigations appear to parallel the beneficial

outcomes of MBIs. Therefore, there is preliminary evidence to suggest that dispositional mindfulness may be seen as having an “ameliorative” association on anxiety, stress, and additional outcomes among undergraduates, though further research is warranted to continue exploring this emerging line of research.

Associations of Mindfulness and Relationship Satisfaction

Based on our lab’s conceptual model of mindfulness as an ameliorative factor (Salmon et al., 2011), level of dispositional mindfulness may serve an ameliorative role in the development of roommate relationships and overall roommate relationship satisfaction. The development of roommate relationships may be characterized as social support and a facet of coping, as outlined above in the model, within the context of adjustment to college life. Therefore, the level of dispositional mindfulness in roommates may thus, facilitate positive roommate relationships. This association between mindfulness and roommate relationship satisfaction is further supported by the theoretical work of Burgoon (2000), which demonstrates the potential role of mindfulness within interpersonal interactions. Burgoon outlines the way in which mindfulness has been proposed to correspond with an individual’s communication patterns, such that a more mindful individual may display flexible, creative, and complex communication patterns, and may demonstrate greater engagement in listening to another individual’s communications. Level of mindfulness within interpersonal interactions was also proposed to be related to the novelty of the situation, such that individuals may display increased levels of mindfulness in the face of more novel situations, as these situations require greater attention to surroundings. Overall, Burgoon’s theoretical review of the association between mindfulness and interpersonal interactions suggests that social

interactions may be most beneficial when both individuals within the social context are exhibiting mindfulness. Translated into the context of college roommates, Burgoon's theoretical work may suggest college as a novel situation in which individuals may display increased levels of mindfulness. Further, if two roommates display more mindful communication patterns within the dyad, it is possible that these interactions may facilitate roommate satisfaction. Although there appears to be an application of roommate relationships to both conceptual and theoretical models presented, no known studies have conducted MBIs within the context of roommate relationships, nor explored the associations of dispositional mindfulness with factors of relationship satisfaction among undergraduate roommates.

Despite this paucity of research among mindfulness and roommate relationship satisfaction, a nascent and minimal body of literature has explored the association of dispositional mindfulness with measures of relationship satisfaction in other populations. One such study of 55 married women and 40 married men examined the association between dispositional mindfulness and marital satisfaction (Burpee & Langer, 2005). These researchers proposed mindfulness as an individual characteristic that may foster an environment within the marital relationship that is rich with open-mindedness and flexibility. Findings revealed that married men and women with higher levels of dispositional mindfulness reported greater marital satisfaction. Similar findings were revealed in a study among 33 heterosexual married couples, such that greater dispositional mindfulness was associated with greater marital quality (Wachs & Cordova, 2007). These researchers further identified two emotion skills that fully mediated the relationship between mindfulness and relationship quality, suggesting that couples who

are collectively more mindful have greater awareness of and identification of emotions, with a greater ability to be responsive versus reactive in the presence of difficult emotions. These skills appear to provide increased relationship quality for more mindful couples.

An additional study demonstrated that greater dispositional mindfulness was associated with relationship satisfaction among college students in dating relationships (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007). Results from this study also provided preliminary evidence of interaction style as a mechanism facilitating this association between dating couples. Specifically, greater mindfulness was associated with adaptive interaction styles, such as self-control and accommodation, as opposed to negative interaction styles of verbal aggression and negativity. These findings suggest that dispositional mindfulness may foster adaptive interaction styles with a relational partner, thereby contributing to increased relationship satisfaction.

Collectively, these three studies provide preliminary evidence to suggest that dispositional mindfulness is associated with relationship satisfaction; greater levels of dispositional mindfulness appear to serve an ameliorative role within relationships. Two studies further posit two mechanisms that may facilitate the ameliorative impact of mindfulness on relationship satisfaction: emotion skill and interaction style. These findings highlight the importance of examining associations of dispositional mindfulness with specific relational factors that correspond with relationship satisfaction in order to better understand how mindfulness may facilitate improved satisfaction in relationships.

Applying Associations of Mindfulness and Relationship Satisfaction to College Roommates

Existing literature suggests that dispositional mindfulness may be an ameliorative factor corresponding with relationship satisfaction. However, findings that support this association have been focused solely on romantic relationships. The application of findings from romantic relationships to that of non-romantic college roommate relationships may therefore be poor, given that relationship satisfaction may be defined differently in romantic versus non-romantic relationships. Thus, it is important to identify specific relational factors applicable to college roommates that might serve a mechanistic role between dispositional mindfulness and relationship satisfaction.

Bowlby's theory of attachment may provide a theoretical foundation for understanding relational factors applicable to college roommates. As reviewed above, this theory posits that individuals are "pre-programmed" to form attachments with other individuals for survival. In response to the social transition of college, including the potential loss of proximal closeness with family and high school friends, college students are often faced the need to replace these attachments to survive in new surroundings. Therefore, the presence of college roommates presents a unique opportunity to form new attachments and adjust to social transitions, which demonstrates the particular relevance of Bowlby's theory for college roommates.

Stemming from Bowlby's theory of attachment, three specific relational factors have been identified as important to securing and developing relationship satisfaction, regardless of type of relationship: mutual trust, quality of communication, and extent of alienation (Armsden & Greenberg, 1987). Therefore, examination of mutual trust, quality

of communication, and extent of alienation as factors of relationship satisfaction may be relevant in understanding the associations of dispositional mindfulness on roommate relationship satisfaction.

Mutual trust. A wealth of literature has examined the association between mutual trust and relationship satisfaction among various dyadic relationships, including married couples (Larzelere & Huston, 1980), parent-child dyads (Armsden & Greenberg, 1987), friends (Nickerson & Nagle, 2004), and business transactions (Andaleeb, 1996; Garbarino & Johnson, 1999). When placed within the relational context, trust is characterized by confidence, dependence, and reliability in another individual. One specific model of dyadic relationships proposed by Selnes and Sallis (2003) examined dyadic factors that may impact the overall functioning of a dyadic unit. These researchers identified a process called relationship learning wherein two individuals make sense of shared information and integrate the information into memory to guide future behavior. Five relationship factors were proposed as influential to the process of relationship learning to improve the overall performance of the dyadic unit (i.e., collaborative commitment, internal complexity, environmental uncertainty, transaction-specific assets, and relational trust). Despite the proposed need for all five factors to influence relationship learning, the level of relational trust was identified as the most important consideration for the overall success and performance of the dyad. The relational quality of trust may be particularly relevant among roommate relationships, particularly students of racial minority status, as race-related anxiety predicted lower levels of perceived trust in the institution in one longitudinal study (Mendoza-Denton et al., 2002). It is also possible that trust in roommate may be particularly important in the context of interracial

college roommate dyads, given that interracial dyads reported lower satisfaction with roommate compared to same-race dyads (Shook & Fazio, 2008; Trail et al., 2009).

Quality of communication. Research has also demonstrated the importance of communication between two members of a dyad in the development and maintenance of relationship satisfaction. Specifically, it has been suggested that relationship satisfaction is derived from multiple aspects of communication, including an individual's own communication skills and an individual's perception his/her dyadic partner's communication skills (Meeks, Hendrick, & Hendrick, 1998). Therefore, optimal relationship satisfaction is reaped when individuals possess effective communication skills and perceive a dyadic partner as possessing effective communication skills. The importance of communication skills within interpersonal relationships has been further supported by the theoretical work of Burgoon et al. (2000) outlined above, which demonstrated the role of mindfulness in facilitating optimal communication patterns. Quality of communication has also been demonstrated as particularly important during times of hardship and transition. For example, women with breast cancer reported lower levels of distress and higher levels of relationship satisfaction when the women's relational partners engaged in reciprocal communication during cancer-related discussions (Manne et al., 2004).

Extent of alienation. Not surprisingly, the extent to which an individual feels alienated by specific others has been demonstrated within the literature to be a feature detrimental to the functioning of and satisfaction within relationships. Although there appears to be general lack of operational definition of alienation within the relational literature, alienation is often characterized by feelings of social isolation (Armsden &

Greenberg, 1987) and perceived lack of connection with others (Mellor, Stokes, Firth, Hayashi, & Cummins, 2008). A popular model of stress and divorce among married couples illustrates that experiencing high levels of stress can increase alienation within a marriage, leading to lower levels of relationship satisfaction (Bodenmann, 2000; Bodenmann, Ledermann, & Bradbury, 2007). Further, with regard to the college student literature reviewed above, minority students on predominantly White college campuses have reported race-related anxiety and feelings of isolation (Allen, 1992; Allen, 1988; Mendoza-Denton et al., 2002; Smedley et al., 1993), and when paired with a White roommate minority students have reported lower satisfaction with roommate (Shook & Fazio, 2008; Trail et al., 2009). Therefore, extent of alienation may be a highly relevant relational characteristic to examine with roommate satisfaction, particularly among minority students.

Collectively, mutual trust, quality of communication, and extent of alienation are three relational factors with broad application for assessing relationship satisfaction within dyadic relationships. Importantly, assessment of these three factors will enhance generalizability of relationship satisfaction findings from studies of romantic couples to that of non-romantic couples, and vice versa. Thus, exploration of dispositional mindfulness associations with each of these three factors may be an important consideration in understanding the potential ameliorative role of mindfulness on relationship satisfaction among undergraduate roommate dyads.

Dyadic Effects of Dispositional Mindfulness on Anxiety and Relationship Satisfaction Among College Roommates

An important consideration in exploring dispositional mindfulness as an ameliorative factor within a social context, such as college roommates, is the potential for each roommate's level of dispositional mindfulness to influence one another's anxiety and perception of roommate relationship satisfaction. No known studies have specifically examined the potential for levels of dispositional mindfulness to serve an ameliorative, crossover effect on roommate anxiety and relationship satisfaction. However, one research study among multiple sclerosis patient/spousal dyads revealed crossover effects within the dyadic relationship, such that higher levels of acceptance in one dyad member were associated with greater relationship satisfaction in the opposite dyad member (Pakenham & Samios, 2013). This study provided evidence for acceptance, or the embrace of private events without attempts to change them (Hayes, Luoma, Bond, Masuda, & Lillis, 2006)—a construct often associated with mindfulness (Brown & Ryan, 2004)—to be associated with crossover effects on relationship satisfaction.

Additional studies have demonstrated the potential for crossover effects within the context of college roommate dyads. A recent study of 159 college roommate dyads revealed that roommates demonstrated strong accuracy in predicting level of distress in one another (Xu & Shrout, 2018). Additionally, studies have revealed that roommate emotional expressiveness grew in similarity the longer roommates lived together (Anderson, Keltner, & John, 2003), such that having a roommate with a ruminative response style led to development of similar cognitive responses (Haefffel & Hames, 2014). Roommates were also more likely to experience depressive symptoms following

instances of co-rumination within the roommate dyad if the relational quality among roommates was poor compared to roommates high in relational quality (Moreira, Miernicki, & Telzer, 2016). Collectively, these studies suggest that college roommates and appear to attend to the emotional states of one another, which have the potential to affect the perceptions of the other, as well as one's own emotional state. This crossover effect of symptoms has been reported in the literature as "contagion effects" (Joiner & Katz, 1999) and have been demonstrated among a range of relational dyads (Davila & Beck, 2002; Stroud, Feinstein, Bhatia, Hershenberg, & Davila, 2014; Zaider, Heimberg, & Iida, 2010).

An important consideration in assessing crossover effects among roommate dyads is the length of time that two roommates have known one another, as well as the amount of time two roommates spent together on a typical basis. A longitudinal investigation of college roommate acquaintanceship revealed that the behaviors of both roommates complemented one another at 15 weeks, a finding not demonstrated for roommates at only two weeks of acquaintance (Markey & Kurtz, 2006). Despite behaviors that changed to be complimentary between roommates, personality traits were unaffected by roommates over time. Findings by Moreira et al. (2016), which demonstrated the effect of co-rumination on roommate depressive symptoms, revealed that roommates appeared to be quite affected by one another despite having only lived together for two months. Length of acquaintance has been widely studied as a predictor of consensus throughout the personality literature, which has demonstrated mixed findings of importance across various populations (Biesanz, West, & Millevoi, 2007; Kenny, Albright, Malloy, & Kashy, 1994; Kurtz & Sherker, 2003; Paulhus & Bruce, 1992; Paunonen, 1989; Watson,

Hubbard, & Wiese, 2000). However, length of acquaintance continues to be argued as an important consideration in assessing crossover effects in dyads. Additionally, Biesanz (2007) suggested that the amount of time dyads spend together in different environments may be a separate, yet important factor to consider alongside length of acquaintance in assessing dyadic effects.

Overall, the studies reviewed above provide preliminary evidence to suggest the potential for crossover effects to occur among roommate dyads. Further, these studies highlight the importance of assessing dyadic characteristics, including length of acquaintance and time spent together, within the context of dyadic relationships. Importantly, the inherent level of interdependence and influence within dyadic relationships (Simmel & Wolff, 1950), including that of undergraduate roommates, cannot be ignored. Thus, it may be critical to understand the potential for dispositional mindfulness to serve as an ameliorative factor on one's own experience of anxiety and roommate relationship satisfaction, as well as the potential for an individual's level of dispositional mindfulness to ameliorate his/her roommate's experience of anxiety and perception of roommate relationship satisfaction.

Over the years, various dyadic theories and models have proposed ways in which dyad members interact and influence or are influenced by one another. The Actor-Partner Interdependence Model (APIM; Kenny, Kashy, & Cook, 2006) was designed to examine the influence of behavior between two individuals within a specific or standard dyad. As outlined in Figure 2, the APIM highlights the interdependence of dyad members and the potential for certain characteristics of one dyad member to affect the outcomes of both dyad members. APIM outlines two variables of interest – a predictor variable and an

outcome variable – that are separately measured within each dyad member. Illustrated in Figure 2, the first dyad member's predictor and outcome variables are indicated by x and y , respectively, with the second dyad member's predictor and outcome variables indicated by x' and y' , respectively. APIM analyses calculate both actor and partner effects within the model. Actor effects examine the influence of one's predictor score on his/her own outcome, indicated in Figure 2 by the single-headed arrows marked with a . Partner effects examine the influence of one's predictor score on his/her partner's outcome, indicated in Figure 2 by the single-headed arrows marked by p . Actor effects can be understood as intrapersonal influences, whereas partner effects refer to interpersonal influences.

In addition to actor and partner effects, APIM analyses investigate the relationship between members' scores on the predictor variable and outcome variable. Nonindependence in Figure 2 is marked by the curved, double-headed arrows. Significant correlations between scores on predictor or outcome variables represent nonindependence between dyad members, noting that they share something in common. Nonindependence between predictor scores demonstrates that the dyad members are more similar or more dissimilar to one another on the variable of interest than are two individuals outside of the dyad. Nonindependence between outcome scores demonstrates similarity between dyad members that is not explained by the APIM.

The structure of APIM is generalizable across fields of study and is the most widely used model of dyadic design (Kenny et al., 2006). APIM is inherently quantitative for measurable indications of potential influence between members of a dyad. Therefore, use of APIM will help determine the unique contribution of a roommate's dispositional

mindfulness on his/her own level of anxiety and perceived roommate relationship satisfaction (i.e., actor effects), as well as the unique influence of a roommate's dispositional mindfulness on the opposing roommate's level of anxiety and perceived roommate relationship satisfaction (i.e., partner effects). Overall, this application of APIM analyses is highly relevant in understanding both individual and dyadic effects of dispositional mindfulness as an ameliorative factor among undergraduate roommates in the psychosocial adjustment to college life.

Summary / Review of Limitations in the Current Literature

Clear and concerning data demonstrate the need to identify factors that mitigate negative adjustment to college, with levels of distress experienced by college undergraduates on the rise, including rising rates of anxiety. Mitigating experiences of high distress is critical given the impact of anxiety on academic achievement, including GPA, retention rates, and overall healthy adjustment to college life. Transitions in social environment, including college roommate assignments, also alter availability of coping resources for undergraduates, with roommate relationship satisfaction associated with psychosocial functioning. Greater attention placed on understanding factors that may cultivate roommate relationship satisfaction is imperative, as roommate relationships have been associated with academic performance. A conceptual model of mindfulness as an ameliorative factor has illustrated the potential for mindfulness to mitigate the effects of a stressor on a number of stress-health pathways (Salmon et al., 2011). With regard to the stress associated with adjustment to college life, mindfulness may therefore serve an ameliorative role in student experiences of distress and coping patterns.

Despite traditional origins of mindfulness, which propose that mindfulness emerges from meditation practice, a recent body of literature suggests that mindfulness also exists as a dispositional characteristic. This preliminary, though growing body of literature has demonstrated that greater dispositional mindfulness has been associated with psychological benefit, including lower levels of anxiety in undergraduate students. These findings are consistent with the findings of traditional mindfulness-based intervention studies. However, given the novelty and recency of exploring associations of dispositional mindfulness, further research is warranted to replicate findings, including the association of dispositional mindfulness and anxiety in undergraduates.

With regard to the potential for dispositional mindfulness to also mitigate poor social transitions, particularly relationship satisfaction among college roommates, no existing research has examined this specific association. However, a nascent body of literature has demonstrated that greater dispositional mindfulness has been associated with greater relationship satisfaction in romantic couples. Moreover, this body of literature has proposed that mindfulness may act on specific relational factors, thereby leading to relationship satisfaction. Therefore, further research is needed to explore associations of dispositional mindfulness with specific relational factors corresponding with relationship satisfaction in college roommates. Three relational factors in particular – mutual trust, quality of communication, and extent of alienation – warrant investigation given the generalizability of these three factors to multiple types of relationships.

Given the social context of college students, including the intimate nature of college roommates, it is also important to consider the extent to which one roommate's level of dispositional mindfulness may beneficially influence the other roommate. This

“crossover” or dyadic effect has been demonstrated among multiple sclerosis patient/spousal dyads, such that greater acceptance in one dyad member led to increased relationship satisfaction in the other dyad member. However, no current studies have examined the influence of dispositional mindfulness within undergraduate roommate dyads. Further research is needed to explore the potential dyadic effects of dispositional mindfulness on college roommates’ adjustment to college, including levels of anxiety and roommate relationship satisfaction. Importantly, dyadic data analysis models exist in the literature, such as the actor-partner interdependence model (APIM), which can be used to explore such influences.

Study Aims

The first aim of this study is to replicate previous findings demonstrating the association between dispositional mindfulness and anxiety in our sample of undergraduates. The second aim of this study is to explore the association of dispositional mindfulness with roommate relationship satisfaction among college roommate dyads. Specifically, Aim 2 will explore the association of dispositional mindfulness on three specific factors of relationship satisfaction – mutual trust, communication quality, and extent of alienation – that have been identified as important to relationship satisfaction across a range of relationships. Aims 1 and 2 will both assess actor effects, such that data will be explored for each student within roommate dyads to assess dispositional mindfulness as a predictor of his/her own outcomes. The third aim of this study is to explore Aim 1 and Aim 2 within the dyadic context by testing for “crossover” or partner effects of dispositional mindfulness among roommate dyads. In accordance with the

primary aims of this study, the following hypotheses are presented below and visually presented in Figure 3.

Hypotheses

Individual/Actor Effects of Dispositional Mindfulness

1. An individual's greater dispositional mindfulness will be associated with his/her own lower level of anxiety.
2. An individual's greater dispositional mindfulness will be associated with:
 - 2.1 His/her own perception of greater mutual trust in roommate.
 - 2.2 His/her own perception of greater quality of communication with roommate.
 - 2.3 His/her own perception of lower extent of alienation by roommate.

Dyadic/Partner Effects of Dispositional Mindfulness

3. An individual's greater dispositional mindfulness will be associated with:
 - 3.1 His/her roommate's lower level of anxiety.
 - 3.2 His/her roommate's perception of greater mutual trust in the individual.
 - 3.3 His/her roommate's perception of greater quality of communication with the individual.
 - 3.4 His/her roommate's perception of lower extent of alienation by the individual.

Analytic Strategy

Given hypotheses that center on both individual and dyadic effects of dispositional mindfulness among roommate dyads, data will be assessed for potential use of dyadic data analysis using APIM. In order to determine the most appropriate analytic strategy to be used, the dataset containing cleaned summary scores will be transformed

from an individual-level dataset, wherein each row contains data for one individual, to a pairwise dataset, wherein each row contains data for both the individual and his/her roommate. Individual data within the pairwise dataset will be labeled as “actor” variables and an individual’s roommate’s data within the pairwise dataset will be labeled as “partner” variables. The primary assumption of dyadic data analysis – nonindependence – will be tested (Kenny et al., 2006) by computing an intraclass correlation (ICC) of the independent variable in each hypothesis – dispositional mindfulness (depicted in Figure 3 by the curved double-headed arrow in each model; Kashy & Kenny, 2000). An ICC is used to assess nonindependence in dyadic models that involve indistinguishable dyads, or dyads in which there is no systematic factor that can distinguish dyad members from one another, such as two undergraduate roommates.

The ICC will be estimated using a Pearson product-moment correlation between “actor” and “partner” dispositional mindfulness variables. A positive ICC suggests that two roommates’ dispositional mindfulness scores are more similar to one another than two scores outside of the roommate dyad. A negative ICC suggests that two roommates’ dispositional mindfulness scores are systematically more dissimilar than two scores outside of the roommate dyad. Given that the dataset used to calculate the ICC includes data that are double-entered (i.e., data included as both actor and partner variables), the ICC will be corrected for the number of dyads (k) and transformed into a z-score for determination of statistical significance of the ICC ($z = ICC / (\frac{1}{\sqrt{k}})$). The statistical significance of the ICC for dispositional mindfulness will then be computed based on the corrected z-score of the ICC using a 95% confidence interval. A significant ICC would confirm that the assumption of dyadic data analysis – nonindependence – had been met

and would provide justification for data to be analyzed using dyadic data analysis. A non-significant ICC would fail to meet the assumption of dyadic data analysis, signifying that data are not nonindependent, and would provide a justification for the data to be analyzed as if the sample were comprised of random, independent persons.

METHODS

Recruitment

Undergraduate roommate dyads were recruited from the University of Louisville during the Fall 2017 semester. Participants were recruited using two primary modalities: an online participation system (Sona Systems, Ltd.) and brief class presentations by a research representative. The online participation system lists active research studies at the University. A brief synopsis of the parent study (IRB 17.0059, A Dyadic Mindfulness Intervention for College Students and their Roommates – Mechanisms and Health Effects, University of Louisville EVPRI Internal Grant Program) was posted on the online participate system, including a link that could be sent to a roommate for shared understanding of research activities and eligibility criteria. The online participation system was targeted for study recruitment, as the majority of students enrolled in the online research participation system are either first- or second-year students and are typically enrolled in a psychology course that requires participation in research for course credit.

Beginning one month prior to the start of the Fall 2017 semester, a research representative contacted course instructors of lower-level psychology courses, first-year orientation courses, and courses taught within a living learning community (LLC) to obtain permission to conduct a brief class presentation at the start of the Fall 2017 semester. Class presentations provided a brief overview of the parent study, including an overview of eligibility criteria, and students were provided with the contact information

for the study coordinator. Attention was placed on lower-level psychology courses, as the online participation system is primarily comprised of students enrolled in these courses. Additionally, attention was placed on first-year orientation courses, as these students represent one-half of the targeted population for this study – first-year students. Lastly, a focus was also placed on courses taught within a LLC, given that many of these courses are attended by roommate dyads with shared academic interests, providing ease of recruitment of college roommates. Of the 42 professors contacted, 27 provided permission to have a research representative conduct a brief class presentation. Over the course of the Fall 2017 semester, a total of 26 five-minute class presentations were conducted by a research representative. Scheduling conflicts between professors and research representatives limited the number of class presentations conducted, compared to the number of professors who provided permission.

Students demonstrated interest in participating in the parent study by signing up through the online participation system or by emailing the study coordinator following class presentations. Interested students were contacted via email by the study coordinator to confirm eligibility criteria and to coordinate enrollment based on the stepwise enrollment strategy and research activity schedule of the parent study outlined in Figure 4. A stepwise strategy was implemented to allow research activities of the parent study to be appropriately scheduled over the course of the Fall 2017 semester.

Participants

A total of 98 students expressed interest in participating in the parent study over the course of the Fall 2017 semester. A flow chart of participant enrollment is presented in Figure 5. Among the 98 students who were initially interested in participating, 13

students expressed interest by signing up through the online participation system and 85 students expressed interest by emailing the study coordinator following class presentations. All 98 students were contacted by the study coordinator to confirm eligibility criteria and to coordinate enrollment in the parent study.

Participants were required to live with a roommate who was also willing to participate. Both roommates were required to be first- or second-year students, aged 18-26, and fluent in the English language. Recruitment was restricted to first- and second-year students, as these individuals often experience increased stress related to the transitions of college life, including that of living with a college roommate. Moreover, the rates of students living in off-campus housing increase following the second year of college, as these students have often identified preferred roommates and may exhibit a lower level of stress and anxiety associated with the transitions of college life. Students who entered college at the age of 17 were excluded due to the need for parental consent and students above the age of 26 were excluded due to differences in life transitions associated with individuals in this age cohort.

Of the 98 students contacted by the study coordinator, 8 students did not meet eligibility criteria (e.g., 17 years in age, did not have roommate who was willing to participate, or was not a first- or second-year student), 11 students could not commit to the parameters of the parent study due to time conflicts, and 25 students failed to reply to the study coordinator. Therefore, of the 98 students who initially expressed interest, 54 students and their roommates (N=108) were enrolled. An additional eight students were enrolled following email correspondence with an LLC course instructor who expressed interest in having her class of eight first-year students (four roommate dyads) participate

in the parent study. Upon email confirmation with each of these eight students regarding interest in participation, a final total of 58 roommate dyads ($N=116$) agreed to participate and were enrolled.

Procedure

This study was conducted in accordance with the University of Louisville Institutional Human Subjects committee guidelines. Roommate dyads who agreed to participate and were enrolled in the study were contacted via email by the study coordinator to coordinate participation according to the stepwise study design (Figure 4). The stepwise strategy consisted of nine participation groups dispersed over the course of the Fall 2017 semester, with a maximum of eight roommate dyads in each participation group. Participation groups were self-selected by roommate dyads based on time commitments and availability of both roommates to attend study activities together. Participation groups were filled on a first-come, first-serve basis. Roommate dyads were well-dispersed over the nine participation groups, outlined in Table 1.

Based on the scheduled timeline of each participation group, roommate dyads were invited for a one-hour laboratory visit to provide consent and begin study procedures. At the time of initial lab visit, trained research assistants confirmed eligibility criteria and outlined the study procedures of the parent study prior to asking participants to complete informed consent. Three roommate dyads ($n=6$) did not attend their initial lab visit appointment, one dyad declined participation at the time of lab visit due to time conflicts of the parent study, and four dyads were denied participation at the time of lab visit by research assistants, as one participant within each dyad did not meet eligibility

criteria (i.e., 17 years of age). A total of 50 dyads (N=100) provided informed consent and voluntarily agreed to participate in study procedures.

After completion of informed consent, roommate dyads completed an online survey through REDCap (Research Electronic Data Capture), a secure web application for managing online data. Online surveys were completed on two separate, private lab computers and assessed participant demographics, including participant email address. At the end of the lab visit, participants were instructed that a link to online questionnaires would be sent to the email address provided. Participants were asked to click on the link and complete the online questionnaires within one week for completion of baseline assessment. Online questionnaires used in baseline data collection assessed a number of demographic factors, including personal, academic, and roommate-related variables, and measures of dispositional mindfulness, anxiety, and roommate relationship quality.

Measures

Demographic Questionnaire. The demographic questionnaire assessed personal and contact information, including name, email address, birthdate, age, sex, race, ethnicity, parent/guardian home address, and employment status, including typical shifts worked. To maximize power in analyses due to limited representation in each racial and ethnic category, data provided on the race and ethnic variables were utilized to calculate a binary ‘minority status’ variable. Participants who identified their race as White and ethnicity as non-Hispanic were categorized as having a non-minority status. Participants were categorized as having a minority status if they identified their race as American Indian or Alaska Native, Asian, Black or African American, or Native Hawaiian or Other Pacific Islander and/or their ethnicity as Hispanic or Latino.

Additional questions on the demographic questionnaire assessed academic and roommate-related information. The academic section inquired about current major, number of completed college credit hours, GPA, first- or second-year status, tuition assistance, and self-rated stress of the semester. The roommate-specific section inquired about housing situation (e.g., on-campus dorm, off-campus apartment), living situation (e.g., one roommate, two roommates), room-sharing (e.g., personal bedroom, separate beds in the same room), length of time known roommate, roommate placement (e.g., random placement, roommate request), average number of daily waking hours spent with roommate, and identification of which roommate initiated participation in the study. This demographic, academic, and roommate-related information was assessed for potential use as control variables in analyses.

Mindful Attention Awareness Scale (MAAS), trait version. The trait MAAS (Brown & Ryan, 2003) is a 15-item measure of an individual's trait-level or dispositional mindfulness characteristics. Specifically, the trait MAAS examines an individual's tendency to pay attention to, and general awareness of, events occurring in the present moment (e.g., "I find it difficult to stay focused on what's happening in the present," "It seems I am 'running on automatic' without much awareness of what I'm doing."). Each item is rated on a six-point scale ranging from '*Almost Always*' to '*Almost Never*.' A mean score of the 15 items is generated, with higher scores suggestive of higher levels of dispositional mindfulness. The trait MAAS has been validated for use among college student samples (Brown & Ryan, 2003) and has demonstrated high internal consistency (Cronbach's alpha .80 to .90), with high test-retest reliability.

Generalized Anxiety Disorder 7-item (GAD-7). The GAD-7 (Spitzer, Kroenke, Williams, & Löwe, 2006) is a common self-report questionnaire used as a tool to screen for the presence of anxiety. Individuals are asked to rate the extent to which they have been bothered by seven symptoms of anxiety over the course of the past two weeks (e.g., “Feeling nervous, anxious, or on edge,” “Worrying too much about different things”). Each item is rated on a four-point scale ranging from ‘*Not at all*’ to ‘*Nearly every day*.’ A total score is calculated by taking the sum of the seven items. A total score <5 suggests minimal anxiety, a total score of 5 to 9 suggests mild anxiety, a total score of 10 to 14 suggests moderate anxiety, and a total score ≥ 15 is suggestive of severe anxiety. The GAD-7 has demonstrated high sensitivity (89%) and specificity (82%) in identifying Generalized Anxiety Disorder using a cut-off score of 10.

Inventory of Parent and Peer Attachment (IPPA), peer subscale. The peer subscale of the IPPA (Armsden & Greenberg, 1987) is a 25-item measure that examines perceived psychological security in an individual’s relationship with his/her close friends. Specifically, the peer subscale of the IPPA assesses three dimensions of relationship quality: (1) degree of mutual trust, (2) quality of communication, and (3) extent of anger and alienation. For the purposes of this study, this measure was keyed to “roommate” to assess an individual’s perceived mutual trust, communication quality, and extent of alienation with his/her roommate. Example items include, “I can count on my roommate when I need to get something off my chest” (trust), “If my roommate knows something is bothering me, they ask me about it” (communication), and “Talking over my problems with my roommate makes me feel ashamed or foolish” (alienation). Each item is rated on a five-point scale ranging from ‘*Almost Never or Never True*’ to ‘*Almost Always or*

Always True. Negatively worded items are reverse-scored and a sum score for each of the three dimensions is generated; trust, communication, and alienation dimensions are comprised of 10 items, 8 items, and 7 items, respectively. The IPPA has been validated for use among late adolescents and has demonstrated high test-retest reliability (Cronbach's alpha .92). The peer subscale of the IPPA keyed to "roommate" has also been used in previous research among first year college students (Moreira et al., 2016).

Statistical Analyses

Data preprocessing. Data preparation and analyses were conducted using SPSS v22.0 (SPSS IBM, Armonk, NY, 2013). Summary scores were calculated for each independent and dependent measure listed above. The dataset containing cleaned summary scores was transformed from an individual-level dataset, wherein each row contains data for one individual, to a pairwise dataset, wherein each row contains data for both the individual and his/her roommate. Individual data within the pairwise dataset were labeled as "actor" variables and an individual's roommate's data within the pairwise dataset were labeled as "partner" variables.

Data preprocessing explored data for inclusion criteria to confirm that participants lived with at least one roommate, were a first- or second-year student, and aged 18-26. Data were also explored for missing data and extreme outliers to assess factors that may skew analyses. If data were missing for fewer than half of the items used to calculate a summary score, values were replaced using a mean replacement strategy of the other responses on the subscale. Cronbach's alpha was calculated for each summary score to assess the reliability of independent and dependent measures used in analyses.

Testing assumptions of dyadic data analysis. Prior to running analyses, the primary assumption of dyadic data analysis – nonindependence – was tested (Kenny et al., 2006). To examine the degree of nonindependence in the sample of indistinguishable dyads, an intraclass correlation (ICC) for the independent variable in each hypothesis – dispositional mindfulness – was computed. Data revealed a non-significant ICC between actor and partner dispositional mindfulness variables. Thus, data did not meet the assumption for dyadic data analysis; participants appeared statistically as independent persons. Therefore, regression analyses were used to assess hypothesized associations.

Primary analysis.

Preliminary analyses for primary analysis. Additional preliminary analyses were performed to test the assumptions of simple regression analyses, including tests of significant outliers, linearity, homoscedasticity, and normality of residuals. A scatterplot was generated for each hypothesized association to visually examine the presence of outliers. Moreover, casewise diagnostics assessed outliers greater than three standard deviations from the mean for each variable of interest. Cases identified as visual or statistical outliers were examined on a case-by-case basis for potential removal from analysis. Scatterplots generated for each hypothesized association were also used to assess the assumptions of linearity and homoscedasticity. Lastly, to check the assumption of normality, a histogram and Predicted Probability (P-P) plot of residuals were generated for each summary variable. The skewness statistic was also examined for each variable of interest to assess non-normality; a z-skewness value was calculated by dividing the skewness statistic by the standard error of skewness. Data that failed to meet the assumption of normality as evidenced by visual inspection of generated graphs or by z-

skewness values outside of the 95% confidence interval (z-skewness values >1.96), were assessed for possible transformation according to the parameters outlined by Field (2009).

Simple regression analyses for primary analysis. Prior to running analyses, the primary predictor variable – actor dispositional mindfulness – was median centered to improve interpretation of coefficients generated in regression analyses (Kraemer & Blasey, 2004). Using simple regression models, actor effects outlined in hypothesis 1 assessed an individual's dispositional mindfulness as a predictor of his/her own level of anxiety and actor effects outlined in hypothesis 2 assessed an individual's dispositional mindfulness as a predictor of his/her own perception of mutual trust in roommate; quality of communication with roommate; and extent of alienation by roommate. Partner effects outlined in hypothesis 3 assessed an individual's dispositional mindfulness as a predictor of his/her roommate's level of anxiety; perception of mutual trust in the individual; quality of communication with the individual; and extent of alienation by the individual.

Secondary analysis. The literature reviewed herein revealed several factors that may contribute to, or are associated with anxiety and roommate relationship satisfaction among undergraduates. These factors included biological sex, minority status, employment status, academic year, GPA, stress of the semester, length of acquaintance with roommate, and daily time spent with roommate. Therefore, secondary analyses adjusted for both theoretically-derived and empirically-derived control variables in tests of hypotheses. Secondary analyses were considered exploratory, as they were used to inform future hypotheses and were not confirmatory in nature.

Data preprocessing for secondary analysis. Raw scores for sex, employment status, first- versus second-year status, GPA, self-rated stress of the semester, months known roommate, and daily waking hours spent with roommate were taken from the demographic questionnaire for each participant and labeled as “actor” variables. Summary scores for minority status were calculated and labeled as “actor” variables.

Preliminary analyses for secondary analysis. Preliminary analyses and exploration of data was performed to test additional assumptions of hierarchical multiple regression analyses, including tests of significant outliers, linearity, homoscedasticity, and normality of residuals. A scatterplot was generated for each continuous control variable to visually examine the presence of outliers. Moreover, casewise diagnostics assessed outliers by identifying scores greater than three standard deviations from the mean for each continuous control variable. Cases identified as visual or statistical outliers were examined on a case-by-case basis for potential removal from analysis. Scatterplots were also generated to examine the association between each control variable and each outcome variable to assess the assumptions of linearity and homoscedasticity.

To check the assumption of normality, a histogram and Predicted Probability (P-P) plot of residuals were generated for each continuous control variable. The skewness statistic was also examined for each continuous control variable to assess non-normality; a z-skewness value was calculated by dividing the skewness statistic by the standard error of skewness. Continuous control variables that failed to meet the assumption of normality as evidenced by visual inspection of generated graphs or by z-skewness values outside of the 95% confidence interval (z-skewness values > 1.96), were assessed for possible transformation according to the parameters outlined by Field (2009).

Selection of control variables for secondary analysis. Variables assessed as potential control variables included demographic, academic, and roommate-specific variables that could confound hypothesized associations. These variables were derived primarily from the demographic questionnaire. Control variables were selected for inclusion in secondary analyses based on a theoretical or empirical basis. A summary of theoretical and potential empirically-derived control variables assessed for inclusion in secondary analyses is presented in Table 2 and outlined below.

Theoretically-derived control variables were selected based on clear extant empirical support for their association with anxiety or relational variables in college student samples. Specifically, variables identified as having a significant, direct association with one of the dependent variables across two or more empirical studies met criteria for inclusion as a theoretically-derived control variable. Based on the literature review, the following variables were identified as theoretically-derived controls for anxiety: female sex (Chapell et al., 2005; Head & Lindsey, 1983; Hembree, 1988; Misra & McKean, 2000), racial minority status (Allen, 1992; Allen, 1988; Holliday et al., 2016; Masuda et al., 2010; Mendoza-Denton et al., 2002; Smedley et al., 1993), being employed (Eisenberg et al., 2007; Mounsey et al., 2013), first-year status (Cliniciu, 2013; Friedlander et al., 2007), lower GPA (Alpert & Haber, 1960; Chapell et al., 2005; Hembree, 1988), and higher stress of the semester (Friedlander et al., 2007; Misra & McKean, 2000; Ştefan et al., 2018). These six variables were considered theoretically-derived controls in secondary analyses of hypotheses related to actor and partner anxiety (hypotheses 1 and 3.1). Additionally, the following variables were identified as theoretical controls based on association with roommate relationship satisfaction: female

sex (Eagly, 2013; Pascarella & Terenzini, 1980), racial minority status (Liao et al., 2005; Shook & Fazio, 2008; Trail et al., 2009), and first-year status (Erb et al., 2014; Hudd et al., 2000). These three variables were considered theoretically-derived controls for hypotheses related to actor and partner roommate relationship variables (hypotheses 2, 3.2, 3.3, and 3.4).

Additional theoretically-derived controls were identified based on dyadic theory relevant to the recruitment/assessment of participants in dyadic pairs, which introduces inherent dyadic characteristics into study data (Kenny et al., 2006; Simmel & Wolff, 1950), unaddressed in regression analyses. Dyadic factors supported by two or more empirical studies that also met criteria for inclusion as theoretically-derived control variables in analyses of anxiety and relational outcomes were months known roommate (Markey & Kurtz, 2006; Moreira et al., 2016) and daily waking hours spent with roommate (Biesanz et al., 2007).

To test the assumption of multicollinearity among the large number of theoretically-derived control variables identified, Pearson bivariate and point-biserial correlations were calculated among continuous and binary control variables, respectively, for each hypothesis. Based on laboratory convention, correlation coefficients greater than or equal to an absolute value of 0.5 were considered evidence of multicollinearity. Theoretically-derived control variables were also examined for tolerance values less than 0.1 within multiple regression analyses, as these values also suggest that the assumption of multicollinearity was violated (Field, 2009). Theoretically-derived control variables that violated assumptions of multicollinearity were further assessed for inclusion/exclusion. Among multicollinear theoretically-derived control variables, those

with the strongest, statistically significant correlation with the dependent variable were chosen for inclusion. These variables were thereby considered to have both theoretical and empirical support.

A pool of additional possible empirically-derived control variables was generated based on associations suggested by tangential research or indirect associations found in college student data. Specifically, the literature review revealed an existing association between dispositional mindfulness and anxiety (Brown & Ryan, 2003; Masuda & Tully, 2012), as well as literature pointing to the potential influence of anxiety on hypothesized relational outcome measures of trust in roommate, quality of communication with roommate, and extent of alienation by roommate (Valentiner et al., 2017). However, given the dearth of literature on associations between dispositional mindfulness and roommate relationship variables, little is known about anxiety as a potential confounder of these associations. Academic and financial stress (Andrews & Wilding, 2004; Beiter et al., 2015) have been associated with students seeking employment (Bozick, 2007; Mounsey et al., 2013). Poor roommate relationships may increase stress (Dusselier et al., 2005), hinder academic performance (American College Health Association, 2012) and negatively impact student retention (Aitken, 1982; Spady, 1970; Tinto, 1975). However, no known studies have examined the reverse associations of academic or financial stress or of employment status on roommate relationships. Correlation analyses were conducted to explore potential empirically-derived controls including anxiety, stress of the semester, and employment status. Variables that emerged as significantly correlated with indicators of actor and partner roommate relationship satisfaction met criteria for inclusion as empirically-derived controls in secondary analyses of hypotheses 2, 3.2, 3.3, and 3.4.

Possible multicollinearity across theoretically- and empirically-derived controls was checked using Pearson bivariate correlations and point-biserial correlations as described above. For control variables that violated the assumption of multicollinearity, the variable with the stronger, statistically significant correlation with the corresponding dependent variable was selected for inclusion in secondary analyses.

Hierarchical multiple regression analyses for secondary analysis. Prior to running analyses, continuous control variables (i.e., GPA, self-rated stress of the semester, months known roommate, and average daily waking hours spent with roommate) were median centered and binary control variables (i.e., sex, minority status, employment status, and first- versus second-year status) were effects coded (e.g., first-year student coded as $-1/2$ and second-year student coded as $+1/2$) to improve interpretation of coefficients generated in regression analyses and minimize error in statistical inference (Kraemer & Blasey, 2004). A series of eight hierarchical regression analyses were performed, such that all control variables were entered in the first block and actor dispositional mindfulness was entered in the second block of analyses to assess associations of each predictor with each outcome variable outlined in study hypotheses. As outlined in hypothesis 1, control variables and actor dispositional mindfulness were assessed as predictors of actor anxiety. Actor effects outlined in hypothesis 2 assessed control variables and actor dispositional mindfulness as predictors of actor perception of mutual trust in roommate; actor quality of communication with roommate; and actor extent of alienation by roommate. Partner effects outlined in hypothesis 3 assessed actor control variables and an individual's dispositional mindfulness as predictors of his/her

roommate's level of anxiety; perception of mutual trust in the individual; quality of communication with the individual; and extent of alienation by the individual.

Sample size and statistical power for regression analyses. A statistical power analysis was conducted using the G*Power 3.1.9.2 power analysis software. A power analysis was conducted for simple regression analyses outlined in primary analysis and assessed the required sample size for a two-tailed linear regression with one predictor, a significance level (α) of 0.05, and power at 95%. This power analysis estimated that approximately 89 participants are needed to achieve optimal parameters for minimizing type I and type II errors. Given that participants were recruited in roommate dyads, this power analysis suggests that recruitment of approximately 45 dyads was needed.

However, given the potential for missing data, the 50 dyads consented in the present study allow for data to be missing from 10% of the sample in order to still meet optimal power estimates for hypothesized associations.

RESULTS

Data Preprocessing

Fifty dyads (N=100) consented to participate in the parent study in the Fall 2017 semester. Initial examination of data revealed that six individuals did not meet inclusion criteria and were excluded from all analyses (age less than 18). Exploration of data revealed missing data for only one participant on independent and dependent variables. Given that this individual did not provide responses on any baseline measures, the data from this individual was excluded from all analyses. Visual inspection of data revealed four extreme outliers with regard to the variable time known roommate, such that two dyads consisted of roommates of family members. Casewise diagnostics demonstrated that these four outliers were greater than three standard deviations from the mean of the sample. Given that one of the aims of the present study was to assess perceptions of roommate relationship factors, which is inherently different between family members and the remaining sample, the two dyads of family members were removed from all analyses.

After excluding participants who did not meet inclusion criteria (n=6), the participant who did not complete measures of independent and dependent variables (n=1), and the participants who presented as extreme outliers with regard to time known roommate (n=4), the final sample used in analyses of actor effects consisted of 89 participants. For analyses of partner effects, the final sample consisted of 82 participants, which excluded both members of dyads wherein one individual did not meet inclusion criteria (n=12), both members of the dyad wherein one individual had missing data (n=2),

and dyads of extreme outliers with regard to time known roommate ($n=4$). A summary of sample characteristics for the final sample is presented in Table 3. Participants ranged in age from 18 to 20 years. The majority of the sample was female (73%), non-Hispanic White (68.5%), unemployed (64%), and first-year college students (91%). Participants' GPA ranged from 2.30-4.36, with the majority of students earning a GPA of 3.0 or greater (78%). On average, participants rated the stress level of the semester as a 6.47 on a scale of 1 to 10, with higher numbers signifying greater stress. The length of acquaintance between two roommates ranged from two weeks to six years, with a median of three months' acquaintance among roommates. On average, participants spent 5.89 waking hours with their roommate on a typical day.

Calculation of Cronbach's alpha for independent and dependent variables revealed that the measures of dispositional mindfulness (MAAS) and anxiety (GAD-7) were highly reliable; 15 items, $\alpha=.93$ and 7 items, $\alpha=.93$, respectively. Cronbach's alphas for the 10 trust items, 8 communication items, and 7 alienation items of the Inventory of Parent and Peer Attachment scale keyed to 'roommate' were .95, .94, and .70, respectively. Descriptive statistics of independent and dependent variables are presented in Table 4.

Dispositional mindfulness mean scores (MAAS) were well-distributed, ranging from 1 to 5.93, with higher scores representing higher levels of dispositional mindfulness. On average, participants endorsed moderate levels of dispositional mindfulness ($M=3.49$, $SD=1.12$), consistent with other healthy college samples. Participant scores on the GAD-7 revealed that on average, students endorsed mild levels of anxiety ($M=7.52$, $SD=6.08$). Specifically, 34 participants fell within the 'minimal' range of anxiety, 29 participants

fell within the ‘mild’ range of anxiety, 10 participants fell within the ‘moderate’ range of anxiety, and 16 participants fell within the ‘severe’ range of anxiety. Based on the recommended clinical cut-off score of 10, approximately one-third of participants may meet criteria for a Generalized Anxiety Disorder. Participant scores on the IPPA peer subscale revealed relatively high levels of perceived trust in roommate ($M=41.44$, $SD=8.59$) compared to a total possible score of 50. The levels of perceived quality of communication with roommate varied across the total range of possible scores from 8 to 40, with scores resembling a normal distribution ($M=28.04$, $SD=8.45$). Lastly, participant scores on the alienation subscale of the IPPA revealed that participants endorsed low-to-medium levels of alienation by roommate ($M=14.29$, $SD=4.66$), with scores ranging from 7 to 29 out of a total possible alienation score of 35.

Testing Assumptions of Dyadic Data Analysis

An intraclass correlation (ICC) for the independent variable in each hypothesis – dispositional mindfulness – was computed using Person product moment correlation of the actor and partner dispositional mindfulness variables. The ICC for dispositional mindfulness was $r(82)=.20$ (95% CI = -0.02, 0.40). Given that the dataset used to calculate the ICC includes data that were double-entered (i.e., data included as both actor and partner variables), the ICC was corrected for the number of dyads and transformed into a z-score for determination of statistical significance of the ICC. A corrected z-score was calculated using the following formula, where k represents the number of dyads; $z = ICC / (\frac{1}{\sqrt{k}})$. After correcting for the number of dyads with valid actor and partner variables ($k=41$), the ICC for dispositional mindfulness was non-significant, $z(40)=1.29$, $p>.05$. Thus, data did not meet the assumption for dyadic data analysis; participants

appeared statistically as independent persons. Therefore, regression analyses were used to assess hypothesized associations.

Primary Analysis

Given that the independent variable – dispositional mindfulness – was found to be independent within roommate dyads, a series of simple regression analyses were used to test hypothesized relationships.

Preliminary analyses for primary analysis. Preliminary analyses and exploration of data were performed in statistical tests of assumptions for regression analyses. Scatterplots and casewise diagnostics assessing statistical outliers revealed one potential case as an outlier for the actor and partner variables of perceived trust in roommate and one potential case as an outlier for the actor and partner variables of perceived extent of alienation by roommate. Closer examination of each of these cases, including visual inspection with scatterplots, revealed that neither of the two cases were extreme outliers; no further evidence emerged for exclusion of these two cases from analyses and thus, were not removed. Scatterplots generated for each hypothesized association revealed that the assumptions of linearity and homoscedasticity were met.

Lastly, data were visually inspected for normality of residuals with histogram and P-P plots and statistically examined through calculations of the z-skewness statistic for each variable in hypothesized associations. The variables of actor dispositional mindfulness, actor and partner perceived communication with roommate, and actor and partner perceived extent of alienation by roommate met the assumption of normality. Variables that did not meet the assumption of normality, as evidenced by visual inspection and the absolute value of z-skewness values >1.96 were: actor and partner

anxiety ($|z\text{-skew}| = 2.98$; $|z\text{-skew}| = 2.57$) and actor and partner perceived trust in roommate ($|z\text{-skew}| = 5.31$; $|z\text{-skew}| = 5.17$). The measures of actor and partner anxiety were positively skewed and were transformed using a square root transformation (Field, 2009). The measures of actor and partner mutual trust in roommate were severely negatively skewed and were transformed by first reverse-scoring the measure to produce a positive skew, and then corrected using a square root transformation (Field, 2009). All variables met the assumption of normality following transformation.

Simple regression analyses for primary analysis. The variable actor dispositional mindfulness was median centered prior to running analyses to improve interpretation of coefficients generated in regression analyses (Kraemer & Blasey, 2004). Results of simple regression analyses are presented in Table 5.

Hypothesis 1. Actor dispositional mindfulness significantly predicted actor anxiety, $t(87)=-2.94, p=.004$. The results of this regression revealed that an individual's level of dispositional mindfulness explained 9% of the variance in his/her level of anxiety, with greater dispositional mindfulness predicting lower anxiety.

Hypothesis 2.1. The association between actor dispositional mindfulness and actor perceived trust in roommate was non-significant, $t(87)=-1.40, p>.05$.

Hypothesis 2.2. Actor dispositional mindfulness significantly predicted actor perceived quality of communication with roommate, $t(87)=2.22, p=.029$. The results of this regression revealed that an individual's level of dispositional mindfulness explained 5.4% of the variance in the perceived quality of communication with his/her roommate, with greater dispositional mindfulness predicting greater perceived quality of communication.

Hypothesis 2.3. The association between actor dispositional mindfulness and actor perceived extent of alienation by roommate was non-significant, $t(87)=-1.28, p>.05$.

Hypothesis 3.1, 3.2., 3.3., 3.4. No partner associations of dispositional mindfulness emerged as significant. Actor dispositional mindfulness was not significantly associated with partner anxiety ($t(80)=-1.35, p>.05$), partner perceived trust in roommate ($t(80)=.879, p>.05$), partner perceived quality of communication with roommate ($t(80)=-.70, p>.05$), nor partner perceived extent of alienation by roommate ($t(80)=.09, p>.05$).

Secondary Analysis

A series of hierarchical multiple regression analyses adjusted both theoretical and empirical control variables in hypothesized relationships.

Preliminary analyses of potential control variables for secondary analysis.

Preliminary analyses and exploration of potential control variables (sex, minority status employment status, first- versus second-year status, GPA, self-rated stress of the semester, months known roommate, and daily waking hours spent with roommate) were performed in statistical tests of assumptions for multiple regression analyses. Scatterplots and casewise diagnostics for each continuous control variable revealed no significant outliers. Scatterplots further revealed that the assumptions of linearity and homoscedasticity were met. Each continuous control variable was visually inspected for normality of residuals with histogram and P-P plots and statistically examined through calculations of the z-skewness statistic. The control variable of actor self-rated stress of the semester met the assumption of normality. Continuous control variables that did not meet the assumption of normality, as evidenced by visual inspection and the absolute value of z-skewness values > 1.96 were: actor GPA ($|z\text{-skew}| = -3.32$), months known

roommate ($|z\text{-skew}| = 7.49$), and waking hours spent with roommate ($|z\text{-skew}| = 5.55$). The variable actor GPA was severely negatively skewed and was transformed by first reverse-scoring the variable to produce a positive skew, and then corrected using a reciprocal transformation (Field, 2009). The variable months known roommate was severely positively skewed and was transformed using a reciprocal transformation (Field, 2009). The variable waking hours spent with roommate was positively skewed and was transformed using a natural log transformation (Field, 2009). The variables actor GPA and waking hours spent with roommate met the assumption of normality following transformation. The variable months known roommate did not meet the assumption of normality following transformation ($|z\text{-skew}| = 7.47$), therefore the histograms of both the original and transformed variables were visually compared. Based on visual inspection, the histogram of the transformed variable for months known roommate was more normally distributed and was selected for analyses.

Selection of control variables for secondary analysis. A summary of theoretical and empirically-derived control variables used in secondary analyses is presented in Table 6. A total of eight variables (sex, minority status, employment status, first- versus second-year status, GPA, stress of the semester, months known roommate, daily waking hours spent with roommate) were considered theoretically-derived control variables in hypotheses of actor and partner anxiety. A total of five variables (sex, minority status, first- versus second-year status, months known roommate, daily waking hours spent with roommate) were considered theoretically-derived control variables in hypotheses of actor and partner relational variables. The assumption of multicollinearity was examined among theoretically-derived control variables for each hypothesis. Pearson bivariate

correlations were computed for continuous control variables and point-biserial correlations were computed for binary control variables. Given that the control variable months known roommate remained non-normal following transformation, Spearman's rho was used to assess correlations with other control variables. As outlined in Table 7, correlations among theoretically-derived control variables had an absolute value correlation coefficient less than 0.5, which demonstrated that the assumption of no multicollinearity was met for each hypothesis. Each theoretically-derived control variable in hierarchical multiple regression analyses also had a tolerance value greater than 0.1, which further confirmed that the assumption of multicollinearity was met.

Correlation analyses were computed to test the relationship of three potential empirically-derived control variables – anxiety, stress of the semester, and employment status – with actor and partner roommate relationship satisfaction variables. Correlation analyses are outlined in Table 7. Self-rated stress of the semester was significantly correlated with actor perceived trust in roommate ($r = -.22, p < .05$), such that students with lower levels of stress reported lower perceived trust in roommate. Employment status was significantly correlated with actor perceived extent of alienation by roommate ($r = .27, p < .05$), such that employed students reported greater perceived extent of alienation by roommate. No other significant correlations emerged. Self-rated stress of the semester and employment status were included as empirically-derived controls in secondary analyses of actor perceived trust in roommate (hypothesis 2.1) and actor perceived extent of alienation by roommate (hypothesis 2.3), respectively. Multicollinearity across theoretically- and empirically-derived controls was checked for

hypotheses 2.1 and 2.3. Correlation analyses and tolerance values in hierarchical multiple regression analyses revealed that the assumption of multicollinearity was met.

Hierarchical multiple regression analyses for secondary analysis. Continuous control variables were median centered and binary control variables were effects coded to improve interpretation of coefficients generated in regression analyses and minimize error in statistical inference (Kraemer & Blasey, 2004). For each hierarchical regression, control variables were entered in the first block and actor dispositional mindfulness was entered in the second block of analyses.

Hypothesis 1. A hierarchical regression analysis tested eight theoretical control variables (sex, minority status, employment status, first- versus second-year status, GPA, stress of the semester, months known roommate, and daily waking hours spent with roommate) and actor dispositional mindfulness as predictors of actor anxiety. Results are presented in Table 8. Control variables in model 1 significantly predicted actor anxiety, $F(8,80)=3.133$, $p=.004$, and accounted for 23.9% of the variance. The addition of mindfulness in model 2 significantly predicted actor anxiety, $F(9,79)=3.602$, $p=.001$, and accounted for an additional 5.2% of the variance. Moreover, after controlling for all theoretical variables, actor dispositional mindfulness emerged as a significant predictor of actor anxiety ($\beta=-.248$, $p=.018$); students with greater dispositional mindfulness had lower levels of anxiety after controlling for demographic, academic, and roommate-related factors. First- versus second-year status and stress of the semester also emerged as significant individual predictors of actor anxiety in model 1 and model 2, such that second-year students and students with greater stress had greater anxiety.

Hypothesis 2.1. A hierarchical regression analysis tested five theoretical control variables (sex, minority status, first- versus second-year status, months known roommate, and daily waking hours spent with roommate), one empirically-derived control variable (stress of the semester), and actor dispositional mindfulness as predictors of actor perceived trust in roommate. Results are presented in Table 9. Control variables entered in model 1 significantly predicted actor perceived trust in roommate, $F(6,82)=3.492$, $p=.004$, and accounted for 20.4% of the variance. The addition of mindfulness in model 2 significantly predicted actor perceived trust in roommate, $F(7,81)=3.520$, $p=.002$, and accounted for an additional 2.9% of the variance. Minority status emerged as a significant individual predictor in model 1 and model 2 and stress of the semester emerged as a significant individual predictor in model 2, such that minority students and students who reported lower stress had lower perceived trust in roommate.

Hypothesis 2.2. A hierarchical regression analysis tested five theoretical control variables (sex, minority status, first- versus second-year status, months known roommate, and daily waking hours spent with roommate) and actor dispositional mindfulness as predictors of actor perceived quality of communication with roommate. Results are presented in Table 10. Control variables entered in model 1 significantly predicted actor perceived quality of communication with roommate, $F(5,83)=5.066$, $p<.001$, and accounted for 23.4% of the variance. The addition of mindfulness in model 2 significantly predicted actor perceived quality of communication with roommate, $F(6,82)=5.025$, $p<.001$, and accounted for an additional 3.5% of the variance. Sex, minority status, and waking hours spent with roommate emerged as significant individual predictors in model 1 and model 2, such that female students, non-minority students, and

roommates who spent more waking hours together had greater perceived quality of communication with their roommate.

Hypothesis 2.3. A hierarchical regression analysis tested five theoretical control variables (sex, minority status, first- versus second-year status, months known roommate, and daily waking hours spent with roommate), one empirically-derived control variable (employment status), and actor dispositional mindfulness as predictors of actor perceived extent of alienation by roommate. Results are presented in Table 11. Control variables entered in model 1 significantly predicted actor perceived extent of alienation by roommate, $F(6,82)=3.633$, $p=.003$, and accounted for 21% of the variance. The addition of mindfulness in model 2 significantly predicted actor perceived extent of alienation by roommate, $F(7,81)=3.165$, $p=.005$, though only accounted for an additional 0.5% of the variance. Minority status and employment status emerged as significant individual predictors in model 1 and model 2, such that minority students and students who were employed reported greater perceived extent of alienation by roommate.

Hypothesis 3.1. A hierarchical regression analysis tested eight theoretical control variables (sex, minority status, employment status, first- versus second-year status, GPA, stress of the semester, months known roommate, and daily waking hours spent with roommate) and actor dispositional mindfulness as predictors of partner anxiety. Results are presented in Table 12. Partner anxiety was not significantly predicted by control variables in model 1 nor by the inclusion of actor dispositional mindfulness in model 2. No individual variables emerged as significant predictors of partner anxiety.

Hypothesis 3.2. A hierarchical regression analysis tested five theoretical control variables (sex, minority status, first- versus second-year status, months known roommate,

and daily waking hours spent with roommate) and actor dispositional mindfulness as predictors of partner perceived trust in roommate. Results are presented in Table 13. Partner perceived trust in roommate was not significantly predicted by control variables in model 1 nor by the inclusion of actor dispositional mindfulness in model 2. No individual variables emerged as significant predictors of partner perceived trust in roommate.

Hypothesis 3.3. A hierarchical regression analysis tested five theoretical control variables (sex, minority status, first- versus second-year status, months known roommate, and daily waking hours spent with roommate) and actor dispositional mindfulness as predictors of partner perceived quality of communication with roommate. Results are presented in Table 14. Control variables entered in model 1 significantly predicted partner perceived quality of communication with roommate, $F(5,76)=3.163$, $p=.012$, and accounted for 17.2% of the variance. The addition of actor dispositional mindfulness in model 2 significantly predicted partner perceived quality of communication with roommate, $F(6,75)=3.055$, $p=.010$, and accounted for an additional 2.4% of the variance. Actor sex and waking hours spent with roommate emerged as significant predictors in model 1 and model 2, such that having a female roommate and having roommates who spent more waking hours together was associated with higher levels of perceived quality of communication with roommate.

Hypothesis 3.4. A hierarchical regression analysis tested five theoretical control variables (sex, minority status, first- versus second-year status, months known roommate, and daily waking hours spent with roommate) and actor dispositional mindfulness as predictors of partner perceived extent of alienation by roommate. Results are presented in

Table 15. Partner perceived extent of alienation by roommate was not significantly predicted by control variables in model 1 nor by the inclusion of actor dispositional mindfulness in model 2. No individual variables emerged as significant predictors of partner extent of alienation by roommate.

DISCUSSION

Overview of Significant Findings in Hypothesized Associations

The current study sought to fill gaps in the literature by exploring dispositional mindfulness as an ameliorative factor of psychological and social factors in a sample of college roommates. Two known studies have demonstrated a negative association between dispositional mindfulness and anxiety in college student samples (Brown & Ryan, 2003; Masuda & Tully, 2012), which provided preliminary evidence of the potential association of dispositional mindfulness with psychological distress in undergraduates. However, further research was needed to replicate this association to increase understanding of the stability of this relationship. Replication of this association is especially relevant given the rising rates of anxiety among college students (Gallagher, 2015; Xiao et al., 2017) and the implications of anxiety for academic achievement, drop-out, and poor adjustment to college (Alpert & Haber, 1960; Chapell et al., 2005; DeBerard et al., 2004). Additionally, though the association between dispositional mindfulness and relationship satisfaction has been revealed among romantic dyads (Barnes et al., 2007; Burpee & Langer, 2005; Wachs & Cordova, 2007), no known studies have explored this association within college roommates. Understanding the potential association between mindfulness and roommate satisfaction is also particularly important given the association of poor roommate relationships with academic and social functioning (Aitken, 1982; Erb et al., 2014; Sacerdote, 2001; Spady, 1970; Tinto, 1975). Thus, the current investigation sought to explore the association of dispositional

mindfulness with anxiety and three specific factors of relationship satisfaction – trust, quality of communication, and extent of alienation – in a sample of college roommates. This study also sought to explore the potential “crossover,” or partner effects, of an individual’s level of dispositional mindfulness with levels of anxiety and satisfaction in his/her relationship satisfaction with a roommate.

As hypothesized, greater dispositional mindfulness was significantly associated with lower levels of anxiety and greater perceived quality of communication with roommate. These two significant findings were actor effects, such that an individual’s level of dispositional mindfulness was only associated with his/her own outcomes. The negative association between dispositional mindfulness and anxiety replicates previous findings in college student samples, as noted above. Moreover, the positive association between dispositional mindfulness and quality of communication with roommate is a novel finding within an undergraduate population, as well as within the larger context of non-romantic dyads. Important implications of these findings are outlined below.

When placed in the context of our lab’s conceptual model (Figure 1; Salmon et al., 2011), results of the current investigation suggest that dispositional mindfulness may demonstrate an ameliorative role with multiple facets of a stress-health pathway. Specifically, dispositional mindfulness may be associated with both emotional outcome and social support. Possessing greater levels of mindfulness may foster lower levels of negative emotional outcome, such as anxiety, and enhance communication within relationships to facilitate social support in the face of a stressor, such as college. However, the cross-sectional design of the current study does not provide inference of directionality to suggest that level of dispositional mindfulness *influences* emotional

outcome or social support factors. And, on the other hand, strong social relationships and healthy emotion may lead to greater dispositional mindfulness. Therefore, longitudinal research is needed to explore these associations over time to inform directionality of findings. Despite lack of causal understanding in the current study, the valence of the associations among dispositional mindfulness and anxiety and roommate satisfaction appear favorable.

Additionally, findings of the current investigation are among the first to suggest that mindfulness may be associated with both intrapersonal and interpersonal constructs in a sample of college roommates. The majority of research on dispositional mindfulness has focused on associations with intrapersonal constructs, including physical health and psychological well-being (Brown & Ryan, 2003; Masuda & Tully, 2012; Murphy et al., 2012; Zimmaro et al., 2016). This focus on intrapersonal factors may be a reflection of the Westernization of mindfulness and the individualistic culture of Western society. However, cultivation of mindfulness in Eastern traditions was conceptualized as a pursuit of enlightenment or self-discovery, often enriched by a sense of connectivity to others and the community at large (Harvey, 2012). This sense of community and ability to connect with others has been recognized as an essential element for spiritual growth in the origins of mindfulness and Buddhist principles, which is termed *sangha*. More specifically, *sangha* describes a community of individuals who share a common purpose (Prebish, 2015). Having a sense of shared purpose and intention is thought to facilitate connection with others, and enhance support and personal growth. With these Eastern principles in mind, undergraduates may be seen as being a part of the college community, surrounded by individuals with shared goals and intentions, including one's roommate.

Therefore, the current study may represent a more balanced integration of Western influences with Eastern origins of mindfulness. Further, results of the current study, which demonstrated the associations of dispositional mindfulness with psychological and social factors, may provide a more holistic understanding of dispositional mindfulness as it relates to both intrapersonal and interpersonal factors.

This integration and assessment of intrapersonal and interpersonal constructs is further supported by the biopsychosocial model. This widely cited model outlines the co-influence of biological, psychological, and social factors on health and illness (Engel, 1977). The recognition and formal establishment of the biopsychosocial model was largely influential for the history and evolution of health psychology, as it introduced two new aspects – psychological and social – into the traditional biomedical model (Engel, 1977). However, despite the consideration of mindfulness throughout the literature as demonstrating benefits to health and well-being, mindfulness literature has often neglected the ‘social’ domain of the biopsychosocial model. A paucity of research has explored mindfulness within the context of relationships, as well as the association of mindfulness with social outcomes (Gambrel & Keeling, 2010). The design and methodology of the current study illustrate the feasibility of assessing mindfulness within the context of roommate relationships, and findings demonstrate the importance of assessing mindfulness associations with both psychological and social factors. Though the current study did not assess the third aspect of the biopsychosocial model – biological factors – the literature demonstrating biological underpinnings of mindfulness may help inform findings in the current study.

Extant literature assessing the associations of mindfulness with neurobiology suggests that structural and functional differences exist between long-term meditators compared to non-meditators (Boccia, Piccardi, & Guariglia, 2015; Fox et al., 2014; Hölzel et al., 2007; Manna et al., 2010; Tomasino, Fregona, Skrap, & Fabbro, 2013; Treadway & Lazar, 2010). Two recent meta-analyses revealed that individuals with mindfulness experience demonstrated increased activation of the prefrontal cortex (PFC), sensory cortices, insula, hippocampus, and cingulate cortex (Boccia et al., 2015; Fox et al., 2014). Similar findings were revealed in a recent systematic review, which demonstrated that MBIs led to increased activity in the PFC, cingulate cortex, insula, and hippocampus and decreased amygdala activity, and improved functional connectivity between the PFC, hippocampus, and amygdala (Gotink, Meijboom, Vernooij, Smits, & Hunink, 2016). Brain regions identified across these studies suggest that mindfulness is associated with neural processes involved in attention, including attention toward inner and outer experiences, memory and decision-making, and self- and emotion-regulation.

Of particular relevance to the current study is the notion that mindfulness may increase attention and awareness of both internal and external experiences, reflective of intrapersonal and interpersonal factors described above. It is possible that individuals with greater dispositional mindfulness in the current study may have been able to regulate emotional responses in stressful situations, such as the transition and adjustment to college life. This ability to regulate emotion may have mitigated the negative experiences of anxiety in response to the demands of college and allowed students to increase attention toward interpersonal experiences with a roommate. Moreover, given that neural changes have been demonstrated in individuals following mindfulness training, it is

possible that implementation of a MBI among undergraduates may lead to changes in brain structure and function, which may have down-stream effects on psychological and social functioning. However, research is needed to illuminate these speculations and specifically examine the associations of mindfulness with neurobiological, psychological, and social factors in undergraduates. It is critical to understand the potential ameliorative effect of mindfulness on all three elements of the biopsychosocial model, as this holistic approach captures the true interconnectedness of factors within an individual's daily life.

Overall, it can be argued that an individual's level of dispositional mindfulness may be an important consideration in the psychosocial adjustment to college life. As reviewed above, numerous implications of study findings point to the importance of longitudinal research and implementing interventions among undergraduates aimed at enhancing levels of mindfulness. Koru mindfulness, a more recent application of MBI, was specifically designed for emerging adults, with wide application on college and university campuses (Greeson, Jueberg, Maytan, James, & Rogers, 2014; Rogers & Maytan, 2012). Though the literature is nascent, Koru has demonstrated similar psychological and physical health benefits to MBSR, including improvements in stress and sleep, as well as increases in overall levels of mindfulness (Greeson et al., 2014). Therefore, it may be beneficial to implement Koru mindfulness on college campuses to enhance levels of mindfulness among undergraduates. Additionally, given the novel finding that dispositional mindfulness may also be important in the context of roommate relationships, universities should consider the implementation of Koru mindfulness among roommate dyads. It is possible that Koru could be incorporated into residence hall programming, which could provide ease of dissemination and offer benefits for both

individuals within roommate dyads. Importantly, this line of longitudinal research may elucidate mindfulness as one factor that has the potential to mitigate negative effects of anxiety and roommate satisfaction on poor academic outcomes, and facilitate greater student retention and academic success.

Main Findings

Testing assumptions of dyadic data analysis. In testing the assumptions of dyadic data analysis, findings revealed that roommate dyads were independent on the measure of dispositional mindfulness. This suggests that there was not a mutual influence of dispositional mindfulness within roommate dyads; roommate dyads were neither more similar or more dissimilar in dispositional mindfulness compared to two individuals chosen at random. Within the literature, dispositional mindfulness is often referred to and measured as a trait, or innate characteristic (Baer, 2011). Further, personality literature among dyads, including college roommates, suggests that traits are more stable and are less likely to demonstrate cross-over influences with dyads compared to cross-over effects of behavior and emotions (Kenny et al., 1994; Markey & Kurtz, 2006; Watson et al., 2000). Therefore, findings are consistent with the literature, which suggests that dispositional mindfulness may act as a more stable trait that is less likely to converge between two roommates.

However, it is also possible that roommates in the current study were too newly acquainted to demonstrate cross-over effects, as descriptive statistics revealed the median length of acquaintance among roommates was three months. Extant literature has revealed that the longer two individuals lived with one another, the more they grew in similarity (Anderson et al., 2003; Haefel & Hames, 2014). Additionally, though

described as a stable “trait,” levels of dispositional mindfulness have also been shown to change in response to intervention (Baer, 2011). Therefore, it is possible that nonindependence in measures of dispositional mindfulness may be found between two individuals with a longer amount of shared time together. Future studies should recruit roommates with greater variance in length of acquaintance to inform the stability of dispositional mindfulness and the potential influence of mindfulness within dyads.

Primary analyses. Primary analyses examined both actor and partner effects of dispositional mindfulness on measures of anxiety and three aspects of roommate relationship satisfaction – trust, quality of communication, and extent of alienation. An overview of primary analyses is presented in Table 16.

Hypothesis 1. In this sample of undergraduates, greater dispositional mindfulness was associated with lower levels of anxiety. This finding replicates previous studies that have demonstrated the negative association between dispositional mindfulness and anxiety in a sample of undergraduates. Therefore, it appears that the relationship between mindfulness and anxiety is reliable across undergraduate samples. Moreover, the current study contributes to the literature by demonstrating this association using a brief, clinical measure of anxiety (GAD-7) in a healthy sample of undergraduates. Given the reported rising rates of anxiety among undergraduates, use of a clinical measure of anxiety may help illustrate levels of anxiety in student populations using standard clinical cut-offs. Classifying student samples according to clinical cut-offs may help determine the generalizability of findings to student samples with varying levels of anxiety symptoms. This is especially critical, given that the association between dispositional mindfulness and anxiety has only been demonstrated in non-clinical student samples. Thus, results of

the present study, which demonstrated the relationship of mindfulness and anxiety in a sample of students with mild anxiety, may not generalize to students with clinical levels of anxiety. It is possible that symptoms of anxiety in clinical samples, such as repetitive negative thought, may suppress the relationship of mindfulness and anxiety. Therefore, future investigations should consider use of the GAD-7 in measuring anxiety in undergraduate samples to understand if mindfulness associations persist in clinical samples. Importantly, the GAD-7 was found to be a reliable measure in the current study, which provides support for use in future investigations among college student samples.

Hypothesis 2.2. This investigation also contributes to the literature by being the first known study to demonstrate the association of dispositional mindfulness with a social variable – perceived quality of communication – in a sample of undergraduate roommates. Specifically, greater levels of dispositional mindfulness were associated with greater perceived quality of communication with one’s roommate. To increase understanding of this novel association, it is important to first review the measures of mindfulness and quality of communication. The measure of dispositional mindfulness used in the current study is the Mindful Attention and Awareness scale (MAAS). The following two items on the MAAS would be representative of an individual with low levels of mindfulness: *“I find myself listening to someone with one ear, doing something else at the same time”*; and *“It seems I am ‘running on automatic’ without much awareness of what I’m doing.”* In contrast, individuals with greater dispositional mindfulness would be identified as expressing greater disagreement with the above two items. Further, the quality of communication subscale was comprised of items, such as: *“I like to get my roommate’s point of view on things I’m concerned about”*; *“My*

roommate helps me to understand myself better"; and *"I can tell my roommate about my problems and troubles."* Therefore, the perceived quality of communication with roommate may be centered on the extent to which an individual feels comfortable communicating with his/her roommate and the extent to which communication with one's roommate is valued in addressing concerns.

In consideration the specific measures used, the significant, positive association between mindfulness and communication quality suggests that an individual with greater dispositional mindfulness may be more attentive to his/her roommate and more aware of the conversation between them. This enhanced attention and awareness may help illuminate the level of reciprocation within the roommate relationship and overall perceived quality of communication with roommate. In contrast, an individual with low levels of mindfulness may only provide partial attention to his/her roommate, which may thwart the extent of conversation with a roommate and limit future conversations. In turn, this lower level of mindful attention may lead to poor ratings of quality communication within the roommate dyad.

Overall, this finding highlights the potential for mindfulness to increase quality of communication and engagement within interpersonal interactions, which is consistent with the theoretical work by Burgoon (2000). Burgoon's work also suggests that optimal relationship satisfaction may stem from two individuals with high levels of mindfulness. Therefore, future studies may aim to conduct a MBI among dyads, such as roommates, to investigate if enhancing the levels of mindfulness of both members may lead to increased relationship satisfaction. Additionally, further research is needed to replicate the association between dispositional mindfulness and quality of communication with

roommate, as this association is a novel finding among undergraduate roommates.

Further empirical support would strengthen the validity and reliability of this association and enhance the potential generalizability of findings.

Hypothesis 2.1 and Hypothesis 2.3. Contrary to expectation, dispositional mindfulness was not significantly associated with perceived level of trust in roommate nor the extent of alienation by roommate. The variables of trust and alienation had very little variation, such that the overall sample reported high levels of trust in roommate and low levels of alienation by roommate. Recruitment efforts in the current study may have contributed to high levels of trust and low levels of alienation within roommate dyads, as the majority of roommates volunteered for participation and participation in roommate dyads was required. It is likely that roommate dyads would not have volunteered for joint participation in the current study if they had very low levels of trust in roommate or felt highly alienated by roommate. Thus, sample bias may have contributed to levels of trust and alienation in this sample. However, it is also important to note that most mindfulness studies are prone to selection bias. Overall, the lack of variation in the relational variables of trust and alienation may have contributed to non-significant findings, as a restricted range limits the relationship with other variables. Future efforts should aim to recruit roommate samples with greater variation in levels of trust and alienation, which may enhance the potential for the association of mindfulness with these variables to be revealed.

Hypothesis 3.1, 3.2, 3.3, and 3.4. Lastly, no partner associations of dispositional mindfulness emerged as significant. However, given that the measure of dispositional mindfulness was found to be independent within roommate dyads, there is little evidence

to suggest that crossover effects of dispositional mindfulness would be demonstrated in this sample.

Secondary analyses. Secondary analyses explored theoretical and empirically-derived control variables as potential confounding factors in hypothesized associations. An overview of the results in secondary analyses is presented in Table 17.

Overview of hypothesized associations in secondary analyses. Table 17 illustrates that hypothesized association between dispositional mindfulness and actor anxiety was the only relationship that remained significant after adjustment of control variables. Therefore, the association between dispositional mindfulness and anxiety appears to be a strong, valid, and reliable relationship that persists after accounting for various demographic, academic, or roommate-specific factors. In contrast, the association between dispositional mindfulness and perceived quality of communication with roommate, which was found to be significant in primary analyses, did not remain significant after adjustment of control variables. This lack of significance points to the importance of theoretical control variables in accounting for the variance in perceived quality of communication with roommate. Moreover, it is clear that there is a need to replicate the association between dispositional mindfulness and perceived quality of communication with roommate to support the validity of this relationship. Specific control variables that emerged as significant individual predictors in hypothesized associations are described below.

Hypothesis 1. Two academic-related control variables emerged as significant individual predictors of actor anxiety: academic year and stress of the semester.

Academic year was significantly associated with anxiety, such that second-year students

reported greater anxiety. This finding is contrary to expectation, as the literature suggests that the transition in academic, emotional, and social domains for first-year college students are often associated with levels of anxiety (Friedlander et al., 2007; Ștefan et al., 2018). Findings of the current study suggest that it may be important to increase our understanding of the second-year college experience, including factors that may be contributing to higher levels of anxiety in these students. For example, second-year students may be faced with pressure to declare a major, enrollment in more difficult classes, financial strain and thoughts of getting a job, or increased social drift from high school friends. However, there is a dearth of literature with regard to second-year experiences and the potential for factors described above to influence levels of anxiety for these students. Importantly, caution is warranted in interpreting differences in anxiety based on academic year, as the sample consisted primarily of first-year students (91%). Therefore, results may be skewed toward the individual characteristics of the second-year students in this sample.

Secondary analyses also revealed that greater self-rated stress of the semester was associated with greater anxiety. The association of stress and anxiety has been consistently demonstrated throughout the literature, including among college student samples (Clinciu, 2013; Misra & McKean, 2000). Given that stress levels of the semester have the potential to influence levels of anxiety and subsequent negative academic outcomes, efforts should be made to teach students stress-reduction strategies that have the potential to mitigate such effects, such as mindfulness-based stress reduction techniques. These strategies may be particularly relevant, as the negative association between dispositional mindfulness and anxiety in this study was not confounded by self-

rated stress of the semester. Thus, it is possible that mindfulness may help buffer against levels of stress.

Hypothesis 2. As depicted in Table 17, racial minority status emerged as a significant predictor of all three actor roommate relationship satisfaction variables. In this study, racial minority students reported lower perceived trust in roommate, poorer quality of communication with roommate, and greater perceived alienation by roommate, compared to non-minority counterparts. These secondary findings represent associations at the individual-level and do not account for roommate composition (i.e., pairing of two racial minority students, versus one racial minority student paired with a non-minority student). However, these findings highlight the importance of understanding the role of racial minority status on roommate satisfaction, consistent with existing research exploring racial disparities on college campuses.

The racial segregation of students on college campuses provides an important historical context for understanding racial differences in the current study. As described in the literature review, racial minority college students have consistently reported higher levels of distress on college campuses, including fears centered on rejection (Allen, 1992; Allen, 1988; Mendoza-Denton et al., 2002; Smedley et al., 1993). African American students specifically, have reported lower levels of perceived trust and feelings of isolation throughout the trajectory of their college experience (Mendoza-Denton et al., 2002). Additionally, research among roommate dyads has revealed that interracial roommates reported poorer roommate satisfaction, including a lower desire to live with roommate, compared to same-race roommates (Shook & Fazio, 2008; Trail et al., 2009). This extant literature provides support for the lower levels of roommate satisfaction

reported by racial minority students in the current study. Crucial implications can be gleaned from these findings.

First, it appears critical for universities to attend to the racial make-up of college roommates. Based on the above findings, it may be argued that universities should consider grouping roommates based on race, as same-race roommates demonstrate greater roommate satisfaction (Shook & Fazio, 2008; Trail et al., 2009). However, widely-cited research on the contact hypothesis may stand in contrast to this argument. The contact hypothesis posits that exposure or “contact” to individuals of different racial backgrounds reduces racial tensions over time (Allport, 1954). Support for the contact hypothesis was found in one longitudinal study among college roommates (Shook & Fazio, 2008). Specifically, this study found that roommate satisfaction was initially lower within interracial roommates compared to same-race roommates, but over time racial attitudes improved only for individuals in interracial roommate dyads (Shook & Fazio, 2008). At this time, there does not appear to be clear evidence to promote a system by which universities should pair roommates based on demographic factors. Instead, there is strong evidence to suggest the need for greater awareness of the multitude of disparities that exist for racial minority students. Future research should explore systemic approaches to reduce discrimination and bias on college campuses, as a systems-level intervention may have more meaningful effects on levels of roommate satisfaction among racial minority students than interventions at the individual or dyadic level.

Second, future investigations should aim to explore the potential moderating role of racial minority status in the relationship between mindfulness and roommate satisfaction. It is possible that the quality of increased attention and awareness may be

disruptive within interracial roommate dyads, as roommates may place greater attention on racial differences. It is also possible that the ameliorative role of dispositional mindfulness on roommate satisfaction is masked by the racial climate of different institutions. Thus, future investigations may consider accounting for the racial climate of college campuses when assessing mindfulness associations with relationship variables among minority students, as these associations may differ on predominantly White college campuses and on historically Black college campuses. Implications of these future studies may help elucidate the differential effect of mindfulness among racial minority students and inform the development or application of MBI on college campuses.

Hypothesis 2.1. Stress of the semester emerged as a significant individual predictor of actor perceived trust in roommate, such that individuals who reported lower semester stress had lower perceived trust in roommate. It is possible that this is a spurious finding, given that this factor only emerged as significant in Model 2 of the hierarchical regression, after dispositional mindfulness was entered into the model. Moreover, given that secondary analyses were exploratory and used to inform future hypothesis, it is important for additional studies to assess the potential for stress levels to confound levels of roommate trust and help illuminate the relevance of this finding.

Hypothesis 2.2 and 3.3. Biological sex emerged as a significant individual predictor of both actor and partner perceived quality of communication with roommate. Specifically, females reported greater perceived quality of communication with roommate compared to males, and having a female roommate was associated with greater perceived quality of communication compared to having a male roommate. This sex

difference is consistent with the literature, which has demonstrated that females tend to place greater importance in social relationships (Eagly, 2013). Given that our sample consisted of same-sex roommates, it is possible that two females are more inclined to invest greater time and attention to the roommate relationship, fostering greater perceived quality of communication for both individuals within female roommate dyads. It is important to note that sex differences should be interpreted cautiously, as the sample consisted of a majority of females (73%) and was unbalanced in the number of males and females.

The number of average daily waking hours spent with roommate also emerged as a significant individual predictor of actor and partner communication. Specifically, greater time spent with roommate was associated with increased individual perceptions, as well as increased roommate perceptions of quality of communication with roommate. These results are intuitive, as it may be difficult to perceive a high quality of communication with one's roommate if the two individuals within the roommate dyad are not spending time together. This finding is consistent with Biesanz (2007), who proposed that relational outcomes may be more affected by time spent together in various domains compared to the total length of acquaintance; months known roommate did not emerge as significantly associated with study outcomes.

Hypothesis 2.3. Lastly, employment status emerged as a significant predictor of actor alienation, such that students who were employed perceived greater extent of alienation by roommate. Two items on the alienation subscale may help elucidate the connection between employment status and feelings of alienation. Specifically, *"I feel the need to be in touch with my roommate more often,"* and *"My roommate doesn't*

understand what I'm going through these days.” Based on these items, it is possible that employed students feel as if they are not as connected to, or need to be in touch with his/her roommate more due to work responsibilities. Moreover, if only one roommate is employed within the dyad, there may be a lack of shared understanding with regard to the effort and responsibility required to balance employment on top of a college education. This lack of shared understanding may promote feelings of alienation in the employed roommate.

Summary of secondary analyses. In consideration of the intent of secondary analyses to identify factors that may confound hypothesized associations and inform future hypotheses, the following suggestions for future studies are offered. In assessing the association of dispositional mindfulness and anxiety, it may be important to control for academic factors, such as academic year and reported level of stress of the semester. With regard to the association of dispositional mindfulness and factors of roommate satisfaction, it appears particularly relevant to adjust for racial minority status. Additionally, associations of mindfulness and trust in roommate may need to adjust for reported level of stress of the semester; associations of mindfulness and quality of communication with roommate may need to adjust for biological sex and the average number of daily waking hours spent with roommate; and associations of mindfulness and extent of alienation may need to adjust for employment status, as each of these demographic and roommate-specific variables appear relevant in the context of specific facets of roommate satisfaction.

Strengths and Limitations

Several strengths of the current study exist. A primary strength of the study was the use of a conceptual model to guide hypotheses. This conceptual model provided a foundation for exploring mindfulness as an ameliorative factor with two separate facets of a stress-health pathway that demonstrated particular relevance among undergraduates. This study was also sufficiently powered for primary analyses to detect hypothesized associations, which serves as a strength in the current investigation.

The methodology and study design were also strengths of the current study. In particular, this study recruited both members of roommate dyads and collected the same measures from each individual. Previous studies assessing the association of dispositional mindfulness with relationship satisfaction (Barnes et al., 2007; Burpee & Langer, 2005) failed to recruit and collect data from both members of a relational dyad. Data collected from only one dyad member provides a one-sided and incomplete understanding of the relational concept measured. Additionally, associations observed from the data of one dyad member can only speak to individual effects, with complete disregard of potential dyadic effects. Failure to address the extent to which dyad members influence one another may lead to error in inference of study findings. Therefore, the methodology and design of the current study allowed for investigation of both individual and dyadic associations of variables of interest. This study also used sophisticated dyadic data analysis techniques to properly assess the extent of mutual influence within roommate dyads on the independent variable. The current study was also carefully designed to recruit individuals within the same semester to minimize the potential impact of external factors on study outcomes.

Another strength of the study was the selection and assessment of three facets of relationship satisfaction that have demonstrated relevance across different types of relational dyads. Thus, there may be enhanced generalizability of findings for relationship satisfaction variables to dyads other than undergraduate roommates.

An additional strength of this study was the use of exploratory secondary analyses in identifying various demographic, academic, and roommate-specific variables that may be associated with and may contribute to levels of anxiety and roommate satisfaction among college undergraduates. Results of secondary analyses help inform future hypotheses and reveal potential factors that are important to consider in future study design.

Several limitations of the current investigation also exist. One limitation of the current study is the cross-sectional study design, as findings cannot inform causal relationships. In particular, one of the study's aims sought to understand both the individual and dyadic associations of dispositional mindfulness with roommate relationship variables. However, the cross-sectional design lacks informative value with regard to how these associations may change over time as relationships continue to develop within roommate dyads. A second limitation is that study hypotheses were informed by models of dyadic data analysis, though data did not meet the assumption of nonindependence of mindfulness scores for dyadic data analysis of the current hypotheses. Therefore, this study is necessarily limited in sophistication, particularly with regard to the assessment of partner effects.

An additional limitation of the current study is that participation in this study was restricted to first- and second-year college students and to students who had a roommate

willing to participate. The sample also consisted primarily of individuals who self-identified for participation. Given these restrictions, it possible that sampling bias exists in findings, which may limit generalizability. This study is also limited by the parent study, which required a step-wise enrollment over the course of the semester. It is possible that the usual events of the semester, such as midterms and finals contributed to the level of anxiety students experienced. The current investigation controlled for self-rated stress of the semester, though this measure does not specifically assess semester-related activities to influence study outcomes. This study also relied solely on self-reported measures, which is a study limitation.

Implications / Future Directions

Several important implications and future directions can be drawn from the findings of the current study. Many implications and suggestions for future research have been described throughout this discussion. A few substantial implications deserve reemphasis and overarching future directions are outlined below.

Assessment of multiple biopsychosocial factors. Results of the current study are among the first to demonstrate associations of dispositional mindfulness with both psychological and social factors in a sample of undergraduate roommates. Given the co-influence of biopsychosocial factors, future studies should aim to explore mindfulness as it pertains to multiple domains of the biopsychosocial model. As a follow-up to the current study, neuroimaging research may explore the functional differences between individuals with high and low levels of mindfulness on fMRI tasks of social rejection or social communication tasks. Incorporating these neuroimaging techniques may help illuminate the neural underpinnings of mindfulness associations with psychological and

social factors in the current study. Overall, assessment of multiple biopsychosocial factors would provide a more holistic understanding of the mechanisms and corresponding outcomes of mindfulness as an ameliorative factor and provides an important line of future research.

Recruitment of representative samples. The sample of undergraduate roommates in the current study lacked variation with regard to levels of trust and alienation. In order to increase understanding of the potential for dispositional mindfulness to be associated with these variables, future efforts should be placed on recruiting a more balanced and representative sample. For example, random assessment of roommate dyads throughout residence halls may provide greater estimates of roommate satisfaction variables. The short length of acquaintance among roommate dyads was also limited, which may have contributed to the absence of nonindependence, or mutual influence of levels of mindfulness within roommate dyads. Therefore, future research may aim to explore dyads with greater variation in length of acquaintance to determine if there may be a “tipping point” for dyadic relationships in which levels of dispositional mindfulness may demonstrate a cross-over effect. Future investigations may also choose to explore hypothesized association in samples of other non-romantic dyads, such as friends or co-workers. Investigating hypothesized associations across dyadic types may elucidate the generalizability of study findings and may further support the ameliorative role of mindfulness in interpersonal interactions.

Longitudinal design. Future investigations with longitudinal designs are needed, as the cross-sectional design of the current study limits understanding of the directionality of associations. Universities may consider implementing MBI into mandatory

programming, such as into the curriculum of the first-year initiatives course found on many college campuses. This policy change may reduce rates of psychological distress among college students, which may reduce the burden on university counseling centers. Additionally, if dyadic effects are found in implementing MBI among one or both members of roommate dyads, this may provide support for incorporating mindfulness-based practices into residence hall programming to strengthen mindfulness skills among both members of a roommate dyad.

Longitudinal research among roommate dyads may also help facilitate understanding of how mindfulness may affect an individual, as well as his/her roommate. An optimal study design may involve a randomized-controlled trial with three groups of roommate dyads: (1) a control group of roommates who do not participate in a MBI; (2) a group of roommate dyads with one roommate in each dyad participating in a MBI; and (3) a group of roommate dyads with both roommates participating in a MBI together. It is possible that increasing mindfulness in one dyad member may contribute to both actor and partner effects. However, it may be important for both individuals within a dyad to receive mindfulness training in order to facilitate optimal actor and partner effects, including effects of mindfulness on anxiety and roommate relationship satisfaction.

Important clinical implications may arise from a longitudinal investigation based on study findings, given the potential for mindfulness to facilitate improved interpersonal interactions, such as perceived quality of communication. The effects of a MBI on improved relationship factors may provide evidence for the use of mindfulness-based practices in couples therapy, family therapy, and among clinical populations with deficits in social skills. For example, a hallmark symptom of autism spectrum disorder is

difficulty with social interaction and communication. It is possible that teaching mindfulness skills to individuals with autism spectrum disorder, such as attending to or becoming aware of present-moment experiences in social interactions, may be helpful in social skills training.

Conclusions

The current study explored individual and dyadic associations of dispositional mindfulness as an ameliorative factor of anxiety and roommate satisfaction among college undergraduate roommates. Results revealed associations between dispositional mindfulness and quality of communication with roommate, one facet of roommate satisfaction. These findings provided preliminary evidence for the potential role of mindfulness with both intrapersonal and interpersonal factors relevant to the psychosocial adjustment of college students. Longitudinal research may help elucidate the potential benefits of mindfulness and mindfulness-based interventions on the levels of anxiety and roommate satisfaction in college student samples. Future investigation of findings in this study may help inform methods for enhancing college adjustment, including improved psychosocial functioning, student retention, and academic success.

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Figure 1. A published model displaying the ameliorative and stress-reducing aspects of mindfulness and MBSR on stress-health pathways (Salmon et al., 2011), adapted from the Transactional Model of Stress and Coping (Lazarus & Folkman, 1984).

Figure 2. The actor-partner interdependence model (APIM; Kenny et al., 2006). X = predictor variable for person A; X' = predictor variable for person B; Y = outcome variable for person A; Y' = outcome variable for person B; U = residual (unexplained) portion of person A's outcome; U' = residual (unexplained) portion of person B's outcome. Single-headed arrows indicate causal/predictive paths. Double-headed arrows indicate correlated variables, known as measures of nonindependence. Paths labelled as a indicate actor effects and paths labelled as p indicate partner effects.

Hypotheses 1 and 3.1

Hypotheses 2.1 and 3.2

Hypotheses 2.2 and 3.3

Hypotheses 2.3 and 3.4

Figure 3. A visual display of hypotheses represented by four APIM models, which assess the actor and partner effects of dispositional mindfulness with anxiety and three factors of roommate relationship satisfaction – mutual trust, quality of communication, and extent of alienation. Paths labelled as *a* indicate actor effects and paths labelled as *p* indicate

partner effects. Double-headed arrows indicate intraclass correlations, known as measures of nonindependence.

Figure 4. A visual display of the stepwise projected enrollment strategy and research activity schedule of the parent study. Beige boxes indicate baseline data collection, time points associated with the current proposal.

Figure 5. A flow chart of participant enrollment.

Table 1

Roommate dyads enrolled in, and consented to each of the nine participation groups.

	<u>Initially Enrolled</u>		<u>Consented</u>	
	<u>Students (n)</u>	<u>Dyads (k)</u>	<u>Students (n)</u>	<u>Dyads (k)</u>
Group 1	16	8	14	7
Group 2	10	5	10	5
Group 3	10	5	10	5
Group 4	12	6	12	6
Group 5	14	7	6	3
Group 6	16	8	14	7
Group 7	12	6	10	5
Group 8	10	5	8	4
Group 9	16	8	16	8

Table 2

Summary of theoretical and potential empirically-derived control variables assessed for inclusion in secondary analyses.

Predictor variables	Actor variables (n=89)				Partner variables (n=82)			
	Anxiety	Perceived roommate trust in roommate	Perceived quality of communication with roommate	Perceived extent of alienation by roommate	Anxiety	Perceived roommate trust in roommate	Perceived quality of communication with roommate	Perceived extent of alienation by roommate
Actor sex	*	*	*	*	*	*	*	*
Actor minority status	*	*	*	*	*	*	*	*
Actor employment status	*	†	†	†	*	†	†	†
Actor 1st vs. 2nd year status	*	*	*	*	*	*	*	*
Actor GPA	*				*			
Actor stress of semester	*	†	†	†	*	†	†	†
Months known roommate	*	*	*	*	*	*	*	*
Waking hours spent with roommate	*	*	*	*	*	*	*	*
Actor anxiety		†	†	†		†	†	†

Note. *=theoretically-derived control variable, †=potential empirically-derived control variable.

Table 3

Sample characteristics (N=89).

<u>Demographic Variables</u>	<u>Frequency</u>	<u>Percentage</u>
Age	(<i>M</i> =18.20)	(<i>SD</i> =0.43)
Sex		
Male	24	27.0%
Female	65	73.0%
Minority status		
Minority	28	31.5%
Non-minority (non-Hispanic White)	61	68.5%
Employment status		
Not employed	57	64.0%
Employed	32	36.0%
<u>Academic Variables</u>		
1st vs. 2nd year status		
First year	81	91.0%
Second year	8	9.0%
GPA	(<i>M</i> =3.56)	(<i>SD</i> =0.46)
2.0-2.49	2	2.2%
2.5-2.99	9	10.1%
3.0-3.49	19	21.3%
3.5-3.99	38	42.7%
4.0-4.0+	21	23.6%
Stress of semester (1-10 scale)	(<i>M</i> =6.47)	(<i>SD</i> =1.76)
<u>Roommate-specific Variables</u>		
Length of time (months) known study roommate	(<i>M</i> =12.60)	(<i>SD</i> =20.59)
< 2 months	18	20.2%
2 months	22	24.7%
3 months	20	22.5%
4 months	2	2.2%
5-12 months	4	4.5%
13-24 months	9	10.1%
3-5 years	9	10.1%
>5 years	5	5.6%
Waking hours spent with study roommate on a typical day	(<i>M</i> =5.89)	(<i>SD</i> =4.76)
1-1.5 hours	7	7.9%
2-2.5 hours	18	20.2%
3-3.5 hours	13	14.6%
4-4.5 hours	8	9.0%
5-5.5 hours	11	12.4%
6-6.5 hours	8	9.0%
7-12 hours	14	15.7%
>12 hours	10	11.2%

Table 4

Sample descriptives on independent and dependent variables of interest.

<u>Self-report Measures</u>	<u>Mean</u>	<u>SD</u>	<u>n</u>
Actor mindfulness (MAAS)	3.49	1.12	89
Actor anxiety (GAD-7)	7.52	6.08	89
Actor perceived trust in roommate (IPPA)	41.44	8.59	89
Actor perceived quality of communication with roommate (IPPA)	28.04	8.45	89
Actor perceived extent of alienation by roommate (IPPA)	14.29	4.66	89
Partner anxiety (GAD-7)	7.85	6.15	82
Partner perceived trust in roommate (IPPA)	41.49	8.84	82
Partner perceived quality of communication with roommate (IPPA)	28.16	8.65	82
Partner perceived extent of alienation by roommate (IPPA)	14.22	4.67	82

Table 5

Summary of regression analyses assessing actor dispositional mindfulness as a predictor of the outcomes below, outlined by hypothesis number.

<u>Outcome variables</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
1. Actor anxiety (n=89)	-0.336	0.114	-0.300**
2.1. Actor perceived trust in roommate (reverse-coded; n=89)	-0.210	0.150	-0.149
2.2. Actor perceived quality of communication with roommate (n=89)	1.746	0.787	0.231*
2.3. Actor perceived extent of alienation by roommate (n=89)	-0.564	0.442	-0.136
3.1. Partner anxiety (n=82)	-0.171	0.127	-0.149
3.2. Partner perceived trust in roommate (reverse-coded; n=82)	0.142	0.161	0.098
3.3. Partner perceived quality of communication with roommate (n=82)	-0.608	0.871	-0.078
3.4. Partner perceived extent of alienation by roommate (n=82)	0.105	0.471	0.025

Note. * $p < .05$, $R^2 = .054$; ** $p < .01$, $R^2 = .090$.

Table 6

Summary of theoretical and empirically-derived control variables adjusted in secondary analyses of hypothesized associations.

<u>Predictor variables</u>	<u>Actor variables (n=89)</u>				<u>Partner variables (n=82)</u>			
	<u>Anxiety</u>	<u>Perceived trust in roommate</u>	<u>Perceived quality of communication with roommate</u>	<u>Perceived extent of alienation by roommate</u>	<u>Anxiety</u>	<u>Perceived trust in roommate</u>	<u>Perceived quality of communication with roommate</u>	<u>Perceived extent of alienation by roommate</u>
Actor sex	*	*	*	*	*	*	*	*
Actor minority status	*	*	*	*	*	*	*	*
Actor employment status	*			†	*			
Actor 1st vs. 2nd year status	*	*	*	*	*	*	*	*
Actor GPA	*				*			
Actor stress of semester	*	†			*			
Months known roommate	*	*	*	*	*	*	*	*
Waking hours spent with roommate	*	*	*	*	*	*	*	*
Actor anxiety								

Note. *=theoretically-derived control variable, †=empirically-derived control variable.

Table 7

Correlation matrix of control variables, predictor variable (mindfulness), and outcome variables; created for the purpose of assessing multicollinearity and selecting empirically-derived control variables.

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Actor sex	--																
2. Actor minority status	0.025	--															
3. Actor employment status	0.244*	0.104	--														
4. Actor 1st vs. 2nd year status	-0.163	0.044	-0.154	--													
5. Actor GPA	0.18	-0.035	-0.136	-0.159	--												
6. Actor self-rated stress of semester	0.164	0.017	0.119	-0.017	0.04	--											
7. Months known roommate (reciprocal)	0.172	-0.023	0.041	-0.163	-0.023	-0.242*	--										
8. Waking hours spent with roommate	0.106	-0.055	-0.014	-0.020	-0.047	0.052	-0.115	--									
9. Actor Mindfulness	-0.005	-0.095	-0.165	0.068	-0.022	-0.194	0.085	0.262*	--								
10. Actor anxiety	0.161	-0.073	0.165	0.169	0.045	0.361**	0.030	-0.096	-0.300**	--							
11. Actor perceived trust in roommate (reciprocal)	-0.200	-0.282**	0.108	-0.153	-0.020	-0.224*	0.002	-0.138	-0.149	-0.183	--						
12. Actor perceived quality of communication with roommate	0.256*	0.225*	-0.076	0.157	0.043	0.189	-0.100	0.291**	0.231*	0.173	-0.857***	--					
13. Actor perceived extent of alienation by roommate	-0.131	-0.234*	0.266*	-0.011	-0.028	-0.088	0.016	-0.179	-0.136	0.175	0.609***	-0.491***	--				
14. Partner anxiety	0.081	0.011	-0.114	0.038	0.172	0.029	0.012	-0.100	-0.149	0.135	-0.004	0.033	-0.060	--			
15. Partner perceived trust in roommate (reciprocal)	-0.219*	-0.205	0.147	-0.008	-0.279*	-0.133	0.056	-0.153	0.098	-0.004	0.428***	-0.316**	0.354**	-0.191	--		
16. Partner perceived quality of communication with roommate	0.255*	0.128	-0.105	0.040	0.314**	0.196	-0.143	0.295**	-0.078	0.033	-0.316**	0.335**	-0.257*	0.181	-0.857***	--	
17. Partner perceived extent of alienation by roommate	-0.231*	-0.160	-0.021	0.127	0.004	-0.152	0.063	-0.181	0.025	-0.060	0.354**	-0.257*	0.159	0.174	0.612***	-0.492***	--

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); employment status: -1/2=not employed, 1/2=employed; 1st vs. 2nd year status: -1/2=first year, 1/2=second year. * $p < .05$, ** $p < .01$, *** $p < .001$.

Table 8

Summary of hierarchical regression analyses assessing theoretical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of actor anxiety (n=89).

Variable	Model 1			Model 2		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	0.235	0.303	0.084	0.255	0.295	0.091
Actor minority status	-0.291	0.264	-0.109	-0.335	0.257	-0.125
Actor employment status	0.397	0.272	0.153	0.309	0.267	0.119
Actor 1st vs. 2nd year status	1.074	0.446	0.247*	1.148	0.434	0.264*
Actor GPA	0.645	0.961	0.069	0.609	0.933	0.065
Actor stress of semester	0.263	0.074	0.369**	0.232	0.073	0.326**
Months known roommate (reciprocal)	0.417	0.352	0.125	0.487	0.343	0.146
Waking hours spent with roommate	-0.169	0.160	-0.105	-0.061	0.162	-0.038
Actor dispositional mindfulness				-0.277	0.115	-0.248*
R^2		0.239			0.291	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White);

employment status: -1/2=not employed, 1/2=employed; 1st vs. 2nd year status: -1/2=first year, 1/2=second year.

* $p < .05$, ** $p < .01$.

Table 9

Summary of hierarchical regression analyses assessing theoretical and empirical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of actor perceived trust in roommate (reciprocal; $n=89$).

Variable	Model 1			Model 2		
	B	SE B	β	B	SE B	β
Actor sex	-0.577	0.369	-0.163	-0.579	0.364	-0.164
Actor minority status	-0.932	0.335	-0.275**	-0.981	0.331	-0.290**
Actor 1st vs. 2nd year status	-1.019	0.555	-0.186	-0.930	0.550	-0.169
Actor stress of semester	-0.185	0.093	-0.206	-0.216	0.094	-0.240*
Months known roommate (reciprocal)	-0.304	0.446	-0.072	-0.237	0.442	-0.056
Waking hours spent with roommate	-0.278	0.203	-0.138	-0.174	0.209	-0.086
Actor dispositional mindfulness				-0.261	0.147	-0.185
R^2		0.204			0.233	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); 1st vs. 2nd year status: -1/2=first year, 1/2=second year. * $p < .05$, ** $p < .01$.

Table 10

Summary of hierarchical regression analyses assessing theoretical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of actor perceived quality of communication with roommate (n=89) .

<u>Variable</u>	<u>Model 1</u>			<u>Model 2</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	5.034	1.880	0.266**	5.187	1.850	0.274**
Actor minority status	4.051	1.744	0.224*	4.334	1.720	0.240*
Actor 1st vs. 2nd year status	5.384	2.891	0.183	4.845	2.854	0.165
Months known roommate (reciprocal)	-1.786	2.235	-0.079	-2.395	2.218	-0.107
Waking hours spent with roommate	2.913	1.057	0.269**	2.317	1.082	0.214*
Actor dispositional mindfulness				1.487	0.750	0.197
R^2		0.234			0.269	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); 1st vs. 2nd year status: -1/2=first year, 1/2=second year. * $p < .05$, ** $p < .01$.

Table 11

Summary of hierarchical regression analyses assessing theoretical and empirical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of actor perceived extent of alienation by roommate (n=89).

<u>Variable</u>	<u>Model 1</u>			<u>Model 2</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	-1.969	1.087	-0.189	-1.975	1.091	-0.189
Actor minority status	-2.743	0.988	-0.275**	-2.790	0.993	-0.280**
Actor employment status	3.294	0.990	0.341**	3.190	1.005	0.331**
Actor 1st vs. 2nd year status	0.340	1.642	0.021	0.429	1.652	0.026
Months known roommate (reciprocal)	0.151	1.259	0.012	0.273	1.275	0.022
Waking hours spent with roommate	-0.999	0.596	-0.168	-0.879	0.622	-0.147
Actor dispositional mindfulness				-0.306	0.436	-0.074
R^2		0.210			0.215	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); employment status: -1/2=not employed, 1/2=employed; 1st vs. 2nd year status: -1/2=first year, 1/2=second year. ** $p < .01$.

Table 12

Summary of hierarchical regression analyses assessing theoretical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of partner anxiety (n=82).

<u>Variable</u>	<u>Model 1</u>			<u>Model 2</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	0.294	0.367	0.102	0.279	0.367	0.096
Actor minority status	0.021	0.311	0.008	0.011	0.311	0.004
Actor employment status	-0.312	0.316	-0.120	-0.360	0.318	-0.138
Actor 1st vs. 2nd year status	0.215	0.543	0.048	0.208	0.542	0.046
Actor GPA	1.327	1.129	0.140	1.303	1.126	0.138
Actor stress of semester	0.028	0.090	0.037	0.012	0.091	0.016
Months known roommate (reciprocal)	0.020	0.423	0.006	0.034	0.422	0.010
Waking hours spent with roommate	-0.187	0.191	-0.115	-0.105	0.203	-0.065
Actor dispositional mindfulness				-0.163	0.143	-0.142
R^2		0.061			0.077	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); employment status: -1/2=not employed, 1/2=employed; 1st vs. 2nd year status: -1/2=first year, 1/2=second year.

Table 13

Summary of hierarchical regression analyses assessing theoretical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of partner perceived trust in roommate (reciprocal; $n=82$).

<u>Variable</u>	<u>Model 1</u>			<u>Model 2</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	-0.720	0.414	-0.197	-0.669	0.415	-0.183
Actor minority status	-0.675	0.375	-0.197	-0.658	0.374	-0.192
Actor 1st vs. 2nd year status	-0.055	0.642	-0.010	-0.059	0.641	-0.010
Months known roommate (reciprocal)	0.316	0.490	0.074	0.270	0.491	0.063
Waking hours spent with roommate	-0.259	0.228	-0.127	-0.363	0.244	-0.177
Actor dispositional mindfulness				0.200	0.168	0.138
R^2		0.107			0.124	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); 1st vs. 2nd year status: -1/2=first year, 1/2=second year.

Table 14

Summary of hierarchical regression analyses assessing theoretical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of partner perceived quality of communication with roommate (n=82) .

<u>Variable</u>	<u>Model 1</u>			<u>Model 2</u>		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	4.622	2.150	0.235*	4.293	2.144	0.218*
Actor minority status	2.316	1.944	0.125	2.204	1.930	0.119
Actor 1st vs. 2nd year status	0.860	3.333	0.028	0.888	3.306	0.029
Months known roommate (reciprocal)	-3.490	2.545	-0.152	-3.192	2.532	-0.139
Waking hours spent with roommate	2.751	1.186	0.249*	3.424	1.259	0.310**
Actor dispositional mindfulness				-1.303	0.868	-0.167
R^2		0.172			0.196	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); 1st vs. 2nd year status: -1/2=first year, 1/2=second year. * $p < .05$, ** $p < .01$.

Table 15

Summary of hierarchical regression analyses assessing theoretical control variables (Model 1) and actor dispositional mindfulness (Model 2) as predictors of partner perceived extent of alienation by roommate (n=82).

Variable	Model 1			Model 2		
	<u>B</u>	<u>SE B</u>	<u>β</u>	<u>B</u>	<u>SE B</u>	<u>β</u>
Actor sex	-2.128	1.195	-0.200	-2.058	1.206	-0.194
Actor minority status	-1.552	1.080	-0.156	-1.528	1.086	-0.153
Actor 1st vs. 2nd year status	2.249	1.852	0.135	2.243	1.861	0.135
Months known roommate (reciprocal)	1.469	1.414	0.118	1.406	1.425	0.113
Waking hours spent with roommate	-0.870	0.659	-0.146	-1.012	0.708	-0.170
Actor dispositional mindfulness				0.275	0.489	0.065
R^2		0.122			0.126	

Note. Sex: -1/2=male, 1/2=female; minority status: -1/2=minority, 1/2=non-minority (non-Hispanic White); 1st vs. 2nd year status: -1/2=first year, 1/2=second year.

Table 16

Summary of significant associations in simple regression analyses assessing actor dispositional mindfulness as a predictor of actor and partner outcome variables.

Outcome variables	Actor associations	Partner associations
Anxiety	**	-
Perceived trust in roommate	-	-
Perceived quality of communication with roommate	*	-
Perceived extent of alienation by roommate	-	-

Note. * $p < .05$, ** $p < .01$.

Table 17

Summary of significant individual predictors in hierarchical regression analyses of hypothesized associations, adjusted for control variables.

Predictor variables	Actor variables (n=89)				Partner variables (n=82)			
	Anxiety roommate	Perceived trust in roommate	Perceived quality of communication with roommate	Perceived extent of alienation by roommate	Anxiety roommate	Perceived trust in roommate	Perceived quality of communication with roommate	Perceived extent of alienation by roommate
Actor sex	-	-	**	-	-	-	*	-
Actor minority status	-	**	*	**	-	-	-	-
Actor employment status	-	-	-	**	-	-	-	-
Actor 1st vs. 2nd year status	*	-	-	-	-	-	-	-
Actor GPA	-	-	-	-	-	-	-	-
Actor stress of semester	**	*	-	-	-	-	-	-
Months known roommate	-	-	-	-	-	-	-	-
Waking hours spent with roommate	-	-	*	-	-	-	**	-
Actor dispositional mindfulness	*	-	-	-	-	-	-	-

Note. * $p < .05$, ** $p < .01$.

APPENDIX A

Measure of Dispositional Mindfulness

Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)

Below is a collection of statements about your everyday experience. Using the scale below, please indicate *how frequently or infrequently you currently have each experience*. Please answer according to what *really reflects* your experience rather than what you think your experience should be.

	Almost always	Very frequently	Somewhat frequently	Somewhat infrequently	Very infrequently	Almost never
1. I could be experiencing some emotion and not be conscious of it until some time later.	1	2	3	4	5	6
2. I break or spill things because of carelessness, not paying attention, or thinking of something else.	1	2	3	4	5	6
3. I find it difficult to stay focused on what's happening in the present.	1	2	3	4	5	6
4. I tend to walk quickly to get where I'm going without paying attention to what I experience along the way.	1	2	3	4	5	6
5. I tend not to notice feelings of physical tension or discomfort until they really grab my attention.	1	2	3	4	5	6
6. I forget a person's name almost as soon as I've been told it for the first time.	1	2	3	4	5	6
7. It seems I am "running on automatic" without much awareness of what I'm doing.	1	2	3	4	5	6
8. I rush through activities without being really attentive to them.	1	2	3	4	5	6
9. I get so focused on the goal I want to achieve that I lose touch with what I'm doing right now to get there.	1	2	3	4	5	6
10. I do jobs or tasks automatically, without being aware of what I'm doing.	1	2	3	4	5	6
11. I find myself listening to someone with one ear, doing something else at the same time.	1	2	3	4	5	6
12. I drive places on "automatic pilot" and then wonder why I went there.	1	2	3	4	5	6
13. I find myself preoccupied with the future or the past.	1	2	3	4	5	6
14. I find myself doing things without paying attention.	1	2	3	4	5	6
15. I snack without being aware that I'm eating.	1	2	3	4	5	6

Measure of Anxiety*Generalized Anxiety Disorder 7-item (GAD-7; Spitzer, Kroenke, Williams, & Löwe, 2006)*Over the last week, how often have you been bothered by the following problems?

	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

Measure of Roommate Relationship Satisfaction

Inventory of Parent and Peer Attachment (IPPA; Armsden & Greenberg, 1987), peer subscale keyed to 'roommate'

This survey asks about your feelings about your relationship with your roommate who is participating in this study with you. Please read each statement and select the response that tells *how true* the statement is for you now.

	Almost Never or Never True	Not Very Often True	Sometimes True	Often True	Almost Always or Always True
1. I like to get my roommate's point of view on things I'm concerned about.	1	2	3	4	5
2. My roommate can tell when I'm upset about something.	1	2	3	4	5
3. When we discuss things, my roommate cares about my point of view.	1	2	3	4	5
4. Talking over my problems with my roommate makes me feel ashamed or foolish.	1	2	3	4	5
5. I wish I had a different roommate.	1	2	3	4	5
6. My roommate understands me.	1	2	3	4	5
7. My roommate encourages me to talk about my difficulties.	1	2	3	4	5
8. My roommate accepts me as I am.	1	2	3	4	5
9. I feel the need to be in touch with my roommate more often.	1	2	3	4	5
10. My roommate doesn't understand what I'm going through these days.	1	2	3	4	5
11. I feel alone or apart when I am with my roommate.	1	2	3	4	5
12. My roommate listens to what I have to say.	1	2	3	4	5
13. I feel my roommate is a good roommate.	1	2	3	4	5
14. My roommate is fairly easy to talk to.	1	2	3	4	5
15. When I'm angry about something, my roommate tries to be understanding.	1	2	3	4	5
16. My roommate helps me to understand myself better.	1	2	3	4	5
17. My roommate cares about how I am feeling.	1	2	3	4	5
18. I feel angry with my roommate.	1	2	3	4	5
19. I can count on my roommate when I need to get something off my chest.	1	2	3	4	5
20. I trust my roommate.	1	2	3	4	5
21. My roommate respects my feelings.	1	2	3	4	5
22. I get upset a lot more than my roommate knows about.	1	2	3	4	5
23. It seems as if my roommate is irritated with me for no reason.	1	2	3	4	5
24. I can tell my roommate about my problems and troubles.	1	2	3	4	5
25. If my roommate knows something is bothering me, he/she asks me about it.	1	2	3	4	5

CURRICULUM VITAE

Kala Phillips

CONTACT INFORMATION

Department of Psychological and Brain Sciences
University of Louisville
317 Life Sciences Building
Louisville, KY 40292
Email: kala.phillips@louisville.edu

EDUCATION

2019 (expected)	Ph.D.	Clinical Psychology University of Louisville, Louisville, KY (APA accredited program) Cumulative GPA: 3.98 Faculty Advisor: Sandra E. Sephton, Ph.D. Dissertation: <i>Exploring Individual and Dyadic Associations of Dispositional Mindfulness as an Ameliorative Factor of Anxiety and Roommate Satisfaction Among Undergraduate Roommates</i> Committee: Sandra E. Sephton, Ph.D. (chair), Paul Salmon, Ph.D., Elizabeth Cash, Ph.D., Marci DeCaro, Ph.D., Amanda Mitchell, Ph.D. Defended: June 15, 2018
2014 – 2016	M.S.	Clinical Psychology University of Louisville, Louisville, KY Cumulative GPA: 3.98 Faculty Advisor: Sandra E. Sephton, Ph.D.
2009 – 2013	B.A.	Psychology, Minors in Communication Studies and Studio Art Kent State University, Kent, OH Cumulative GPA: 3.94

Summa Cum Laude
Senior Honors Thesis: *Emotional Clarity as a Predictor of Decentering Capacities*
Faculty Advisor: David M. Fresco, Ph.D.

HONORS AND AWARDS

Spring, 2018	Excellence in Clinical Work Award , University of Louisville
Spring, 2018	Excellence in Peer Mentoring Award , University of Louisville
Fall, 2017	Graduate Network in Arts and Sciences Research Fund Award , University of Louisville
Summer, 2017	Graduate Student Council Travel Award , University of Louisville
Spring, 2017	Excellence in Peer Mentoring Award , University of Louisville
Spring, 2016	Graduate Student Council Travel Award , University of Louisville
Spring, 2016	Graduate Network in Arts and Sciences Research Fund Award , University of Louisville
2012 – 2013	Senior Honors Thesis Fellowship , Kent State University
Spring, 2011	Honors Study Away Scholarship , Kent State University
2009 – 2013	President's List / Dean's List , Kent State University
2009 – 2013	Honors Program , Kent State University
2009 – 2013	Honors Scholarship , Kent State University

RESEARCH INTERESTS

Health psychology; Behavioral medicine; Rehabilitation psychology; Mindfulness-based interventions; Patient-caregiver dyads; Dyadic coping; Development of dyadic interventions to promote symptom reduction, adaptive coping, and adjustment among patient-caregiver dyads in the context of acute or chronic illness/injury; Improving accessibility of psychosocial intervention

PUBLICATIONS

PEER-REVIEWED JOURNAL ARTICLES

7. Zimmaro, L.A., Sephton, S.E., Siwik, C., **Phillips, K.**, Rebholz, W., Kraemer, H., Giese-Davis, J., Wilson, L., Bumpous, J., & Cash, E. (2018). Depressive symptoms predict head and neck cancer survival: Examining plausible behavioral and biological pathways. *Cancer*, 124(5), 1053-1060.

6. Borstad, A.L., Crawfis, R., **Phillips, K.**, Lowes, L., Worthen-Chaudhari, L., Maung, D., McPherson, R., Siles, A., & Gauthier, L.V. (2018). In-home delivery of Constraint-Induced Movement therapy via virtual reality gaming. *Journal of Patient-Centered Research and Reviews*, 5(1), 6-17.
5. Siwik, C., Hicks, A., **Phillips, K.**, Rebholz, W.N., Zimmaro, L.A., Weissbecker, I., Cash, E., & Sephton, S.E. (2017). Impact of Coping Strategies on Perceived Stress, Depression, and Cortisol Profiles Among Gynecologic Cancer Patients. *Journal of Health Psychology*. doi:10.1177/1359105317740737
4. Rebholz, W.N., Cash, E., Zimmaro, L.A., Bayley-Veloso, R., **Phillips, K.**, Siwik, C., Chagpar, A.B., Dhabhar, F.S., Spiegel, D., Saltsman-Bell, B.N., & Sephton, S.E. (2016). Distress and quality of life in an ethnically diverse sample awaiting breast cancer surgery. *Journal of Health Psychology*. doi:10.1177/1359105316659916
3. Zimmaro, L.A., Salmon, P., Naidu, H., Rowe, J., **Phillips, K.**, Rebholz, W.N., Giese-Davis, J., Cash, E., Dreeben, S.J., Bayley-Veloso, R., Jablonski, M.E., Hicks, A., Siwik, C., & Sephton, S.E. (2016). Association of dispositional mindfulness with stress, cortisol, and well-being among university undergraduate students. *Mindfulness*, 7(4), 874-885.
2. Gauthier, L.V., Borstad, A., Luong, E., **Phillips, K.**, Lowes, L., Stahr, K., Worthen-Chaudhari, L., Crawfis, R., & Maung, D. (2016). Upper extremity recovery following gamified Constraint-Induced Movement therapy: A case study in dense amnesic TBI. *Brain Injury Professional*, 12(4).
1. Anderson, K., Woodbury, M.L., **Phillips, K.**, & Gauthier, L.V. (2015). Virtual reality games to promote movement recovery in stroke rehabilitation: A guide for clinicians. *Archives of Physical Medicine & Rehabilitation*, 96(5), 973-976.

PUBLISHED ABSTRACTS

19. Hicks, A., Salmon, P., Rebholz, W., **Phillips, K.**, Siwik, C., Zimmaro, L., Cash, E., van der Gryp, K., & Sephton, S.E. (2018). The role of self-compassion in a stress-health pathway. *Psychosomatic Medicine*, 80(3), A76-A77.
18. **Phillips, K.**, Siwik, C., Hicks, A., Salmon, P., Cash, E., Litvan, I., Filoteo, J.V., van der Gryp, K., & Sephton, S.E. (2018). Exploration of dyadic associations of anxiety and diurnal cortisol among Parkinson's disease patient/caregiver dyads. *Psychosomatic Medicine*, 80(3), A28-A29.

17. **Phillips, K.**, Siwik, C., Segerstrom, S., Zimmaro, L., Rebholz, W., Cash, E., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018). Associations between daily affect, intrusive thoughts, and cortisol levels among lung cancer patients. *Psychosomatic Medicine*, 80(3), A83.
16. Sephton, S.E., Hicks, A., **Phillips, K.**, Siwik, C., Albert, C., Zimmaro, L., van der Gryp, K., & Salmon, P. (2018). A brief i-Pod-based mindfulness intervention for undergraduates: Effects on psychological and physiological outcomes. *Psychosomatic Medicine*, 80(3), A67.
15. Siwik, C., Segerstrom, S., **Phillips, K.**, Cash, E., Rebholz, W., Zimmaro, L., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018). Associations of actigraphically measured daytime sedentariness and nighttime restfulness with waking and bedtime salivary cortisol levels. *Psychosomatic Medicine*, 80(3), A101.
14. Siwik, C., **Phillips, K.**, Salmon, P., Litvan, I., Filoteo, J.V., Rebholz, W., Cash, E., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018). An MBSR intervention for Parkinson's disease patients and caregiving partners: Effects on distress, social support, cortisol, and inflammation. *Psychosomatic Medicine*, 80(3), A128.
13. van der Gryp, K., Siwik, C., Zimmaro, L., **Phillips, K.**, Rebholz, W., Cash, E., Hicks, A., & Sephton, S.E. (2018). Lung cancer-related distress is associated with elevated mean diurnal cortisol levels. *Psychosomatic Medicine*, 80(3), A32.
12. Cash, E., Rebholz, W., Albert, C., Fields, O., Zimmaro, L., Siwik, C., **Phillips, K.**, Kloecker, G., & Sephton, S.E. (2017). Associations between the prognostic indicators rest/activity rhythm and diurnal cortisol profiles in patients with lung cancer. *Brain, Behavior, and Immunity*, 66, e31-e32.
11. **Phillips, K.**, Salmon, P., Siwik, C., Rebholz, W., Cash, E., Litvan, I., Filoteo, J.V., Kayser, K., & Sephton, S.E. (2017). A dyadic MBSR intervention for Parkinson's disease patients/caregivers: Effects on distress, cortisol, and inflammation. *Brain, Behavior, and Immunity*, 66, e19-e20.
10. Rebholz, W.N., Cash, E., Siwik, C., **Phillips, K.**, Albert, C., Zimmaro, L., Dhabhar, F.S., Barve, S., & Sephton, S.E. (2017). Pro-inflammatory, chemotactic, and anti-inflammatory cytokine responses associate with HPA, but not SNS, function in lung cancer patients. *Brain, Behavior, and Immunity*, 66, e24.
9. Siwik, C., Rebholz, W., **Phillips, K.**, Cash, E., Dhabhar, F.S., Barve, S., Zimmaro, L., & Sephton, S.E. (2017). *Sense of coherence in lung cancer patients: Association with coping, immune function, and fatigue*. *Brain*,

8. Zimmaro, L.A., Segerstrom, S., Cash, E., Siwik, C., **Phillips, K.**, Rebholz, W., & Sephton, S.E. (2017). Moderating role of mindfulness on daily affect and cortisol in lung cancer patients. *Psychosomatic Medicine, 79*(4), A52-A52.
7. Hicks, A.M., Salmon, P., **Phillips, K.**, Zimmaro, L., Siwik, C., Bayley-Veloso, R., Cash, E., & Sephton, S.E. (2016). The role of mindfulness in stress and depression of undergraduate students. *Psychosomatic Medicine, 78*(3), A101-A102.
6. **Phillips, K.**, Bayley-Veloso, R., Zimmaro, L.A., Siwik, C., Hicks, A.M., Cash, E., Salmon, P., & Sephton, S.E. (2016). Living situation and quality of life among cancer patients. *Psychosomatic Medicine, 78*(3), A73-A73.
5. Siwik, C.J., **Phillips, K.**, Zimmaro, L.A., Bayley-Veloso, R., Hicks, A., Cash, E., Salmon, P., & Sephton, S.E. (2016). Psychological and physiological effects of problem-focused and emotional approach to coping styles in gynecological cancer patients. *Psychosomatic Medicine, 78*(3), A60-A60.
4. Bayley-Veloso, R., Weissbecker, I., Rebholz, W.N., Cash, E., Zimmaro, L.A., **Phillips, K.**, Salmon, P., & Sephton, S.E. (2015). Do traumatic events build resilience and promote survival through social support in gynecologic cancer? *Psychosomatic Medicine, 77*(3), A153-A153.
3. **Phillips, K.**, Salmon, P., Patel, H., Rowe, J., Rebholz, W.N., Zimmaro, L.A., Bayley-Veloso, R., Cash, E., Giese-Davis, J., Sonnier, H., & Sephton, S.E. (2015). The role of mindfulness in stress and health outcomes in university undergraduate students. *Psychosomatic Medicine, 77*(3), A102-A102.
2. Rebholz, W.N., Weissbecker, I., Cash, E., Bayley-Veloso, R., Zimmaro, L.A., **Phillips, K.**, & Sephton, S.E. (2015). Diurnal cortisol rhythm and systemic norepinephrine predict gynecologic cancer survival. *Psychosomatic Medicine, 77*(3), A50-A51.
1. Zimmaro, L.A., Rebholz, W.N., Cash, E., Bayley-Veloso, R., **Phillips, K.**, Salmon, P., & Sephton, S.E. (2015). Optimism as a moderator of psychoneuroimmune pathways in lung cancer patients. *Psychosomatic Medicine, 77*(3), A142-A142.

GRANT ACTIVITY

1.	Title of Project: A Dyadic Mindfulness Intervention for College Students and their Roommates – Mechanisms and Health Effects
Effective Dates: 1/1/2017 – 12/31/2017 |
|----|--|

Role:	Author, Study Coordinator (Principal Investigator: Sandra E. Sephton, Ph.D.)
Agency:	University of Louisville EVPRI Internal Grant Program, Research – Type II
Total Costs:	\$9,900
Study Aims:	Pilot a (Koru + iPod-based) mindfulness intervention among undergraduate roommate dyads; explore neural, cognitive and circadian pathways by which mindfulness practice might lead to healthier levels of distress, well-being, and physical health; and explore the dyadic effects of a (Koru + iPod-based) mindfulness intervention among college roommate dyads.

RESEARCH EXPERIENCE

2014 – Present **Graduate Research Assistant**
Mindfulness and Biobehavioral Health Research Laboratory
Department of Psychological and Brain Sciences
University of Louisville, Louisville, KY
Supervisor: Sandra E. Sephton, Ph.D.

Research Laboratory Mission and Focus:

Explore the biological mechanisms by which psychological states are related to health and resistance to chronic disease. Understand the effects of stress, coping, and social support in chronic illness. Design and test mindfulness-based interventions to alleviate suffering among people who have experienced trauma, chronic illness, and/or difficult life transitions.

2013 – 2014 **Clinical Research Assistant**
Neurorecovery and Brain Imaging Laboratory
Department of Physical Medicine and Rehabilitation
The Ohio State University Wexner Medical Center,
Columbus, OH
Supervisor: Lynne V. Gauthier, Ph.D.

Research Laboratory Mission and Focus:

Improve the quality of life for individuals who have experienced stroke or other neurological injury. Study how rehabilitation interventions promote structural and functional changes in the brain. Make the most effective therapies more fun, cost-effective, and accessible through the use of technology, such as video games.

2012 – 2013

Research Assistant

Psychopathology and Emotion Regulation Laboratory

Department of Psychology

Kent State University, Kent, OH

Supervisor: David M. Fresco, Ph.D.

Research Laboratory Mission and Focus:

Examine factors associated with major depressive disorder and generalized anxiety disorder, including metacognitive factors, peripheral psychophysiology, and emerging work from affective neuroscience, utilizing neuroimaging and electrophysiological techniques. Develop treatments informed by affective and contemplative neuroscience findings that incorporate mindfulness meditation and other practices derived from Buddhist mental training exercises into Western psychosocial treatments.

CONFERENCE PRESENTATIONS

ORAL PRESENTATIONS

5. Hicks, A., Salmon, P., Rebholz, W., **Phillips, K.**, Siwik, C., Zimmaro, L., Cash, E., van der Gryp, K., & Sephton, S.E. (2018, March). *The role of self-compassion in a stress-health pathway*. Paper session on Psychological \ Wellbeing, American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.
4. **Phillips, K.**, Siwik, C., Segerstrom, S., Zimmaro, L., Rebholz, W., Cash, E., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018, March). *Associations between daily affect, intrusive thoughts, and cortisol levels among lung cancer patients*. Paper session on Cancer, American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.
3. **Phillips, K.**, Siwik, C., Salmon, P., Litvan, I., Filoteo, J.V., Rebholz, W., Cash, E., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018, March). *An MBSR intervention for Parkinson's disease patients and caregiving partners: Effects on distress, social support, cortisol, and inflammation*. Paper session on Inflammation, American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.
2. Siwik, C., Segerstrom, S., **Phillips, K.**, Cash, E., Rebholz, W., Zimmaro, L., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018, March). *Associations of actigraphically measured daytime sedentariness and nighttime restfulness with waking and bedtime salivary cortisol levels*. Paper session on Sleep, American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.

1. **Phillips, K.**, Salmon, P., Siwik, C., Rebholz, W., Cash, E., Litvan, I., Filoteo, J.V., Kayser, K., & Sephton, S.E. (2017, June). *A dyadic MBSR intervention for Parkinson's disease patients/caregivers: Effects on distress, cortisol, and inflammation*. Oral Session on Inflammation and Relationships Through the Lifespan, Psychoneuroimmunology Research Society 24th Annual Scientific Meeting, Galveston, TX.

POSTER PRESENTATIONS

17. **Phillips, K.**, Siwik, C., Hicks, A., Salmon, P., Cash, E., Litvan, I., Filoteo, J.V., van der Gryp, K., & Sephton, S.E. (2018, March). *Exploration of dyadic associations of anxiety and diurnal cortisol among Parkinson's disease patient/caregiver dyads*. American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.
16. Sephton, S.E., Hicks, A., **Phillips, K.**, Siwik, C., Albert, C., Zimmaro, L., van der Gryp, K., & Salmon, P. (2018, March). *A brief i-Pod-based mindfulness intervention for undergraduates: Effects on psychological and physiological outcomes*. American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.
15. van der Gryp, K., Siwik, C., Zimmaro, L., **Phillips, K.**, Rebholz, W., Cash, E., Hicks, A., & Sephton, S.E. (2018, March). *Lung cancer-related distress is associated with elevated mean diurnal cortisol levels*. American Psychosomatic Society 76th Annual Scientific Meeting, Louisville, KY.
14. **Phillips, K.**, Siwik, C., Hicks, A., Salmon, P., Cash, E., Litvan, I., Filoteo, J.V., van der Gryp, K., & Sephton, S.E. (2017, October). *Exploration of dyadic associations of anxiety and diurnal cortisol among Parkinson's disease patient/caregiver dyads*. American Psychosomatic Society Mid-Year Meeting – “Emotions in Social Relationships: Implications for Health and Disease,” Berkeley, CA.
13. Siwik, C.J., **Phillips, K.**, Salmon, P., Litvan, I., Filoteo, V., Rebholz, W., Cash, E., Hicks, A., van der Gryp, K., & Sephton, S.E. (2017, October). *An MBSR intervention for Parkinson's disease patients and caregiving partners: Effects on distress, social support, cortisol and inflammation*. American Psychosomatic Society Mid-Year Meeting – “Emotions in Social Relationships: Implications for Health and Disease,” Berkeley, CA.
12. Cash, E., Rebholz, W., Albert, C., Fields, O., Zimmaro, L., Siwik, C., **Phillips, K.**, Kloecker, G., & Sephton, S.E. (2017, June). *Associations between the prognostic indicators rest/activity rhythm and diurnal cortisol profiles in patients with lung cancer*. Psychoneuroimmunology Research Society 24th Annual Scientific Meeting, Galveston, TX.

11. Rebholz, W.N., Cash, E., Siwik, C., **Phillips, K.**, Albert, C., Zimmaro, L., Dhabhar, F.S., Barve, S., & Sephton, S.E. (2017, June). *Pro-inflammatory, chemotactic, and anti-inflammatory cytokine responses associate with HPA, but not SNS, function in lung cancer patients*. Psychoneuroimmunology Research Society 24th Annual Scientific Meeting, Galveston, TX.
10. Siwik, C., Rebholz, W., **Phillips, K.**, Cash, E., Dhabhar, F.S., Barve, S., Zimmaro, L., & Sephton, S.E. (2017, June). *Sense of coherence in lung cancer patients: Association with coping, immune function, and fatigue*. Psychoneuroimmunology Research Society 24th Annual Scientific Meeting, Galveston, TX.
9. Hicks, A., Salmon, P., **Phillips, K.**, Zimmaro, L., Siwik, C., Bayley-Veloso, R., Albert, C., Fields, O., Cash, E., & Sephton, S.E. (2016, March). *The role of mindfulness in stress and depressive symptoms of undergraduate students*. American Psychosomatic Society 74th Annual Scientific Meeting, Denver, CO.
8. **Phillips, K.**, Bayley-Veloso, R., Zimmaro, L.A., Siwik, C., Hicks, A.M., Cash, E., Salmon, P., & Sephton, S.E. (2016, March). *Does living situation affect stress and health outcomes among cancer patients?* American Psychosomatic Society 74th Annual Scientific Meeting, Denver, CO.
7. Siwik, C.J., **Phillips, K.**, Zimmaro, L.A., Bayley-Veloso, R., Hicks, A., Cash, E., Salmon, P., & Sephton, S.E. (2016, March). *Psychological and physiological effects of problem-focused and emotional approach to coping styles in gynecological cancer patients*. American Psychosomatic Society 74th Annual Scientific Meeting, Denver, CO.
6. Bayley-Veloso, R., Weissbecker, I., Rebholz, W.N., Cash, E., Zimmaro, L.A., **Phillips, K.**, Salmon, P., & Sephton, S.E. (2015, March). *Do traumatic events build resilience and promote survival through social support in gynecologic cancer?* American Psychosomatic Society 73rd Annual Scientific Meeting, Savannah, GA.
5. **Phillips, K.**, Salmon, P., Patel, H., Rowe, J., Rebholz, W.N., Zimmaro, L.A., Bayley-Veloso, R., Cash, E., Giese-Davis, J., Sonnier, H., & Sephton, S.E. (2015, March). *The role of mindfulness in stress and health outcomes in university undergraduate students*. American Psychosomatic Society 73rd Annual Scientific Meeting, Savannah, GA.
4. Rebholz, W.N., Weissbecker, I., Cash, E., Bayley-Veloso, R., Zimmaro, L.A., **Phillips, K.**, & Sephton, S.E. (2015, March). *Diurnal cortisol rhythms and systemic norepinephrine predict gynecologic cancer survival*. American Psychosomatic Society 73rd Annual Scientific Meeting, Savannah, GA.

3. Zimmaro, L.A., Rebholz, W.N., Cash, E., Bayley-Veloso, R., **Phillips, K.**, Salmon, P., & Sephton, S.E. (2015, March). *Optimism as a moderator of psychoneuroimmune pathways in lung cancer patients*. American Psychosomatic Society 73rd Annual Scientific Meeting, Savannah, GA.
2. Luong, E., Borstad, A., Siles, A., Lowes, L., **Phillips, K.**, & Gauthier, L. (2015, March). *Increased arm use for daily activities predicts greater quality of life gains from Constraint-Induced Movement therapy*. 20th Annual Denman Forum, Columbus, OH.
1. Jaffe, J., Lowes, L., Borstad, A., Worthen-Chaudhari, L., Crawfis, C., **Phillips, K.**, Maung, D., Adams, J., Siles, A., Marlin, A., McPherson, R., & Gauthier, L. (2014, May). *Gaming for the brain: Video game based arm rehabilitation*. International Research Congress on Integrative Medicine and Health, Miami, FL.

ADVANCED TRAINING IN RESEARCH AND STATISTICS

July, 2017 **Dyadic Data Analysis Workshop**
 Michigan State University, East Lansing, MI
 Instructors: Deborah Kashy, Ph.D., Robert A. Ackerman, Ph.D.

CLINICAL EXPERIENCE

2016 – 2018 **Clinical Graduate Teaching Assistant**
 Noble H. Kelley Psychological Services Center (PSC)
 University of Louisville, Louisville, KY
 Supervisor: Bernadette Walter, Ph.D.

- Served as first-line contact for individuals calling in crisis and facilitating treatment services, assessment services, or providing necessary referrals. Responsible for management of clinical operations, including scheduling, payment records, and chart audits; entrusted with clinic key and file room access. Attended weekly meetings with clinic director to discuss incoming clients and other clinic concerns.

2017 – 2018 **Graduate Level Therapy Practicum Student**
Cognitive Behavioral Therapy Clinical Team
 Noble H. Kelley Psychological Services Center
 University of Louisville, Louisville, KY
 Supervisor: Janet Woodruff-Borden, Ph.D.

- Implemented a cognitive-behavioral therapy approach to assess and treat adults, children, and adolescents with a variety of psychological disorders including anxiety disorders, mood disorders, obsessive-compulsive disorder, and trauma- and stressor-related disorders in a diverse client population. Formulated client conceptualizations and tailored treatment plans with reference to relevant empirical literature and implementation of disorder-specific manualized treatments as appropriate. Participated in weekly, conceptualization-centered group supervision.

2017 – 2018

Graduate Level Therapist

Psychological Services Center Representative

Athena's Sisters

Louisville, KY

Supervisor: Bernadette Walter, Ph.D.

- Provided psychological services and resources for Athena's Sisters, an organization for military women. Provided drop-in hours for therapeutic services prior to bi-monthly organization meetings focused on "Creating Sisterhood" and "Community Healing."

2016 – 2018

Behavioral Health Graduate Student Therapist

Bone Marrow Transplant / Oncology Service

University of Louisville Hospital, Louisville, KY

Supervisor: Elizabeth Cash, Ph.D.

- Implemented brief, behavioral health interventions among leukemia inpatients, including pain management, sleep hygiene, behavioral activation, relaxation techniques, and psychoeducation. Provided CBT and Mindfulness-based therapy services to longer-term bone marrow transplant patients during extended hospital stay. Participated in bone marrow transplant grand rounds as part of an interdisciplinary team and consulted with medical staff regarding patient care.

2016 – 2017

Graduate Level Therapy Practicum Student

Children with ADHD and Related Difficulties (CARDS) Clinical Team

Noble H. Kelley Psychological Services Center

University of Louisville, Louisville, KY

Supervisor: Paul Rosen, Ph.D.

- Implemented a behavioral and skills-based therapy approach to assess and treat children and adolescents with ADHD and related difficulties and their parents. Co-led a parenting group designed to teach parents skills to help manage the frustration and related difficulties experienced by their child with ADHD. Prepared integrative reports with collaboration from external agencies, including teachers and schools or medical doctors, to

facilitate optimal treatment of all clients. Participated in weekly group and individual supervision.

Summer, 2016

Advanced Psychotherapy Practicum Student

Psychiatric Consultation Liaison Service
University of Louisville Hospital, Louisville, KY
Supervisors: Elizabeth Cash, Ph.D. and Jeannie
Roberts, M.D.

- Provided brief, psychological assessment and behavioral health interventions to medical inpatients. Provided follow-up and longer-term therapy for patients with extended hospital stay. Participated in psychiatry consultation medical rounds and collaborated with medical staff regarding patient care.

2015 – 2018

Graduate Level Assessment Practicum Student

Noble H. Kelley Psychological Services Center
University of Louisville, Louisville, KY
Supervisors: Bernadette Walter, Ph.D., Paul Rosen, Ph.D.,
and David Winsch, Ph.D.

- Administered relevant clinical assessments to a diverse population of adults, children, and adolescents and conducted structured interviews for full diagnostic assessment of cognitive functioning, ADHD, learning disabilities, and Advanced Placement or Gifted and Talented programs. Collaborated with external agencies, including teachers/schools and medical professionals for receipt of additional client information and reports. Prepared integrative reports and necessary accommodations under the supervision of licensed psychologists.

2014 – 2016

Graduate Level Therapy Practicum Student

Mindfulness and Acceptance-based Therapy Clinical Team
Noble H. Kelley Psychological Services Center
University of Louisville, Louisville, KY
Supervisor: Paul Salmon, Ph.D.

- Implemented a mindfulness and acceptance-based therapy approach to assess and treat adult community members of diverse backgrounds. Conducted semi-structure intake assessments and prepared integrative reports. Formulated client conceptualizations and treatment plans with reference to relevant empirical literature to tailor treatment to meet individual client needs. Participated in weekly group and individual supervision.

TEACHING EXPERIENCE

Spring, 2018	Co-Instructor , <i>Intellectual and Cognitive Assessment</i> (Graduate-level) University of Louisville, Louisville, KY
Summer, 2017	Co-Instructor , <i>Interviewing Skills Practicum</i> (Graduate-level) University of Louisville, Louisville, KY
Spring, 2017	Co-Instructor , <i>Intellectual and Cognitive Assessment</i> (Graduate-level) University of Louisville, Louisville, KY
Summer, 2016	Co-Instructor , <i>Interviewing Skills Practicum</i> (Graduate-level) University of Louisville, Louisville, KY
2015 – 2016	Guest Lecturer , <i>Physiological Psychology</i> (Undergraduate-level) University of Louisville, Louisville, KY <ul style="list-style-type: none">• <i>Sensorimotor Function</i>, March, 2016• <i>Neural Conduction</i>, February, 2016• <i>Reproductive Behaviors</i>, November, 2015• <i>Sensorimotor Function</i>, October, 2015
Spring, 2016	Graduate Teaching Assistant , <i>Physiological Psychology</i> (Undergraduate-level) University of Louisville, Louisville, KY
Fall, 2015	Graduate Teaching Assistant , <i>Physiological Psychology</i> (Undergraduate-level) University of Louisville, Louisville, KY
Summer, 2015	Graduate Teaching Assistant , <i>Physiological Psychology; Intro to Neuroscience</i> (Undergraduate-level) University of Louisville, Louisville, KY
Spring, 2015	Graduate Teaching Assistant , <i>Personality Psychology; Forensic Psychology</i> (Undergraduate-level) University of Louisville, Louisville, KY

Fall, 2014 **Graduate Teaching Assistant, Physiological Psychology**
(Undergraduate-level)
University of Louisville, Louisville, KY

MENTORSHIP AND SUPERVISION EXPERIENCE

2017 – 2018 **Graduate Student Mentor**
Undergraduate Psychology Honors Thesis
Psychological and Brain Sciences
University of Louisville, Louisville, KY
Thesis Student: Michael Schurfranz
Thesis Title: *Effects of Roommate Sleep and Sleep Variables as Predictors of Roommate Relationship Satisfaction*

- Mentored an undergraduate student through the yearlong process of designing, analyzing, writing, and defending a thesis in fulfillment of the requirements for graduation with honors from the department of Psychological and Brain Sciences.

2017 – 2018 **Graduate Student Supervisor**
Cognitive Behavioral Therapy Clinical Team
Noble H. Kelley Psychological Services Center
University of Louisville, Louisville, KY

- Supervised provision of psychological services and support activity of second- and third-year graduate students.

2017 – 2018 **Graduate Student Mentor**
University of Louisville Cancer Education Program
University of Louisville, Louisville, KY

- Assisted with mentorship of undergraduate and post-baccalaureate student fellows as part of a NIH/NCI sponsored summer program; assisted with interpretation of research findings and preparation of presentations.

2016 – 2018 **Clinical Graduate Teaching Assistant**
Noble H. Kelley Psychological Services Center (PSC)
University of Louisville, Louisville, KY

- Provided peer-supervision to graduate students, including assistance with intake assessments, therapy sessions, psychological testing, and clinic procedures.

2014 – Present **Graduate Research Assistant**
Mindfulness and Biobehavioral Health Research Laboratory
Department of Psychological and Brain Sciences
University of Louisville, Louisville, KY

- Supervised graduate and undergraduate research assistants in lab protocol training (including training in clinical chart review, recruitment, collection of psychosocial, cognitive, and circadian data, and conduct of focus groups), development and analysis of research hypotheses, preparation of presentations, and compliance with ethics training.

2013 – 2014 **Clinical Research Assistant**
Neurorecovery and Brain Imaging Laboratory
Department of Physical Medicine and Rehabilitation
The Ohio State University Wexner Medical Center,
Columbus, OH

- Supervised seven undergraduate research assistants in the collection, entry, and analysis of psychosocial, actigraphy, and structural MRI data, pilot testing and trouble-shooting of a virtual reality gaming system, development and analysis of research hypotheses, preparation of presentations, and compliance with ethics training.

INVITED TALKS AND WORKSHOPS

Phillips, K. & Siwik, C. (2018, April). *Self-compassion Workshop*. Athena's Sisters – an organization for military women, Louisville, KY.

Phillips, K., Siwik, C., Segerstrom, S., Zimmaro, L., Rebholz, W., Cash, E., Hicks, A., van der Gryp, K., & Sephton, S.E. (2018, April). *Associations between daily affect, intrusive thoughts, and cortisol levels among lung cancer patients*. GRADtalks Brown Bag Series, The Graduate Network in Arts & Sciences, University of Louisville, Louisville, KY.

Phillips, K. & Siwik, C. (2017, September). *Coping with Symptoms of Anxiety and Depression in the Context of Chronic Illness*. Better Breathers Club – Support group for people with chronic lung disease, University of Louisville School of Medicine, Louisville, KY.

Phillips, K. & McDonough, S. (2016, July). *Stress and Coping*. University of Louisville GEAR UP Health Sciences Summer Academy, Louisville, KY.

Phillips, K. & Warnecke, A. (2016, June). *Stress and Coping*. Professional and Education Preparation Program, University of Louisville, Louisville, KY.

SPECIALIZED CLINICAL TRAINING

February, 2018	Seminar: LGBT Healthcare Summit, 4 hours
May, 2017	Workshop (Classroom and Field-based): Kentucky Army National Guard – Operation Immersion, 39 hours
December, 2016	Center for Deployment Psychology Tier One Training – The Impact of Deployment on Service Members and their Families, 6.5 hours
May, 2016	Workshop (Classroom and Field-based): Kentucky Army National Guard – Operation Immersion, 39 hours
October, 2015	Workshop: Safe Zone Training, 4 hours

PROFESSIONAL AFFILIATIONS

2018 – Present	Association for Psychological Science
2015 – Present	American Psychosomatic Society
2013, Inducted	Phi Beta Kappa, Nu of Ohio, Honors Society
2010 – 2013	National Society of Collegiate Scholars

SERVICE

2017 – 2018	Cardinal Covenant Liaison Noble H. Kelley Psychological Services Center University of Louisville, Louisville, KY
2016 – 2017	Colloquium Organizer and Community Liaison Clinical Psychology Colloquium and Professional Development Series Department of Psychological and Brain Sciences Noble H. Kelley Psychological Services Center University of Louisville, Louisville, KY
Fall, 2016	Co-facilitator “20 Mindful Minutes,” weekly drop-in mindfulness sessions Health Promotion, a division of Campus Health Services University of Louisville, Louisville, KY
2016	Ad-Hoc Reviewer Annals of Behavioral Medicine